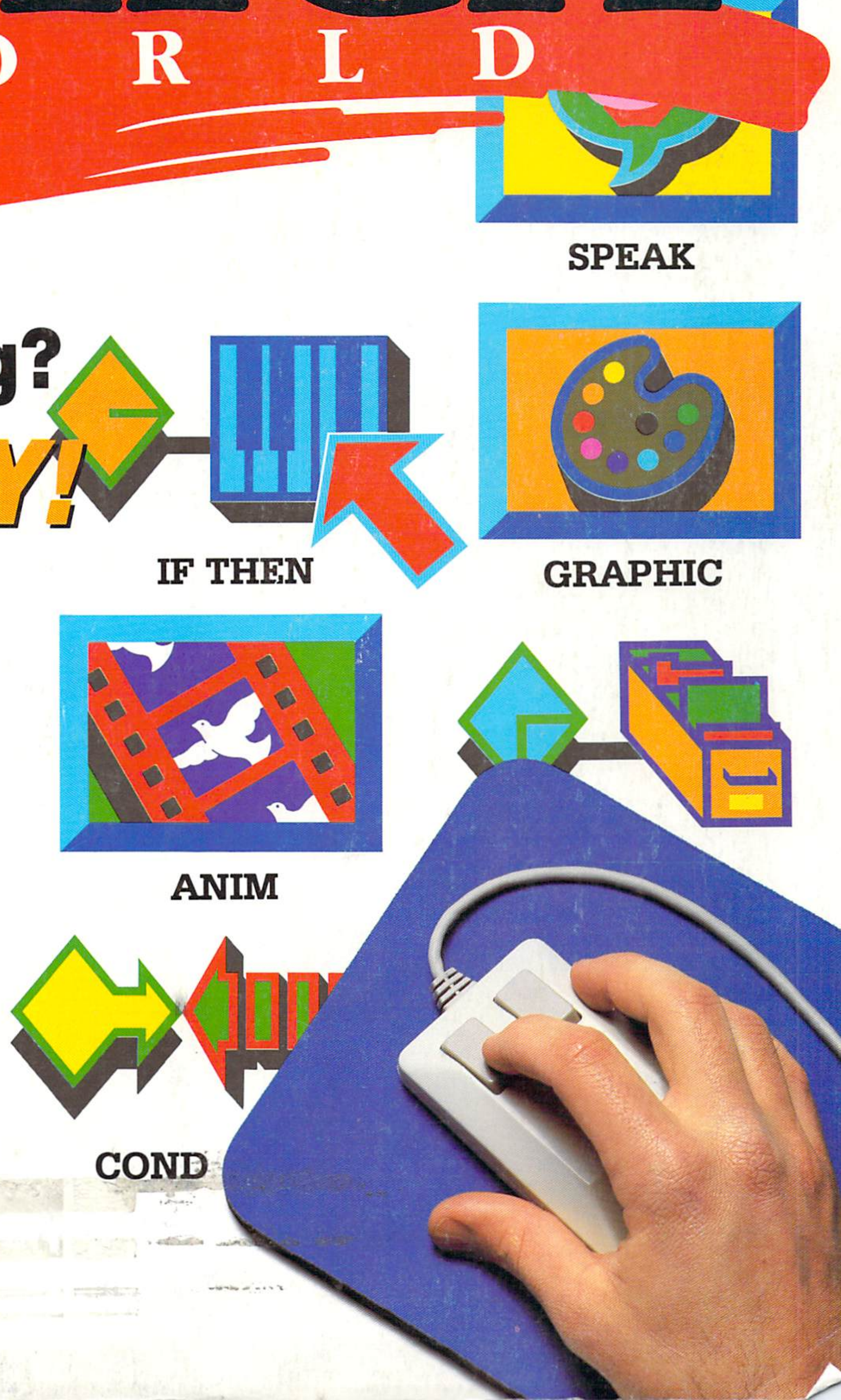
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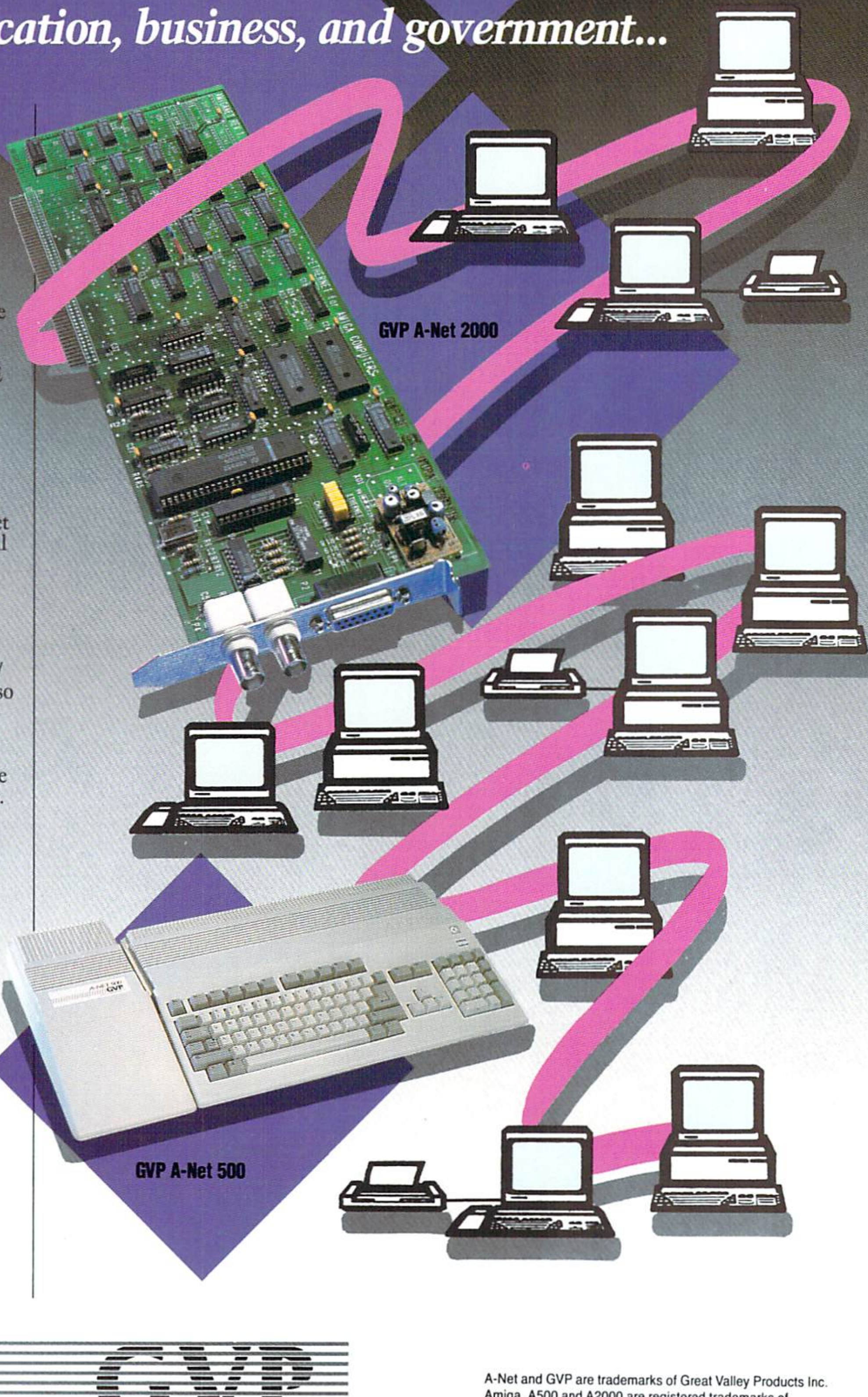
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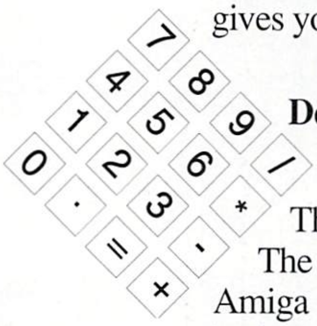
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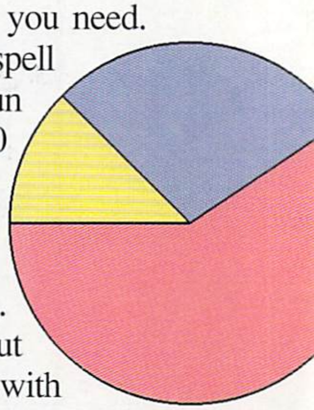
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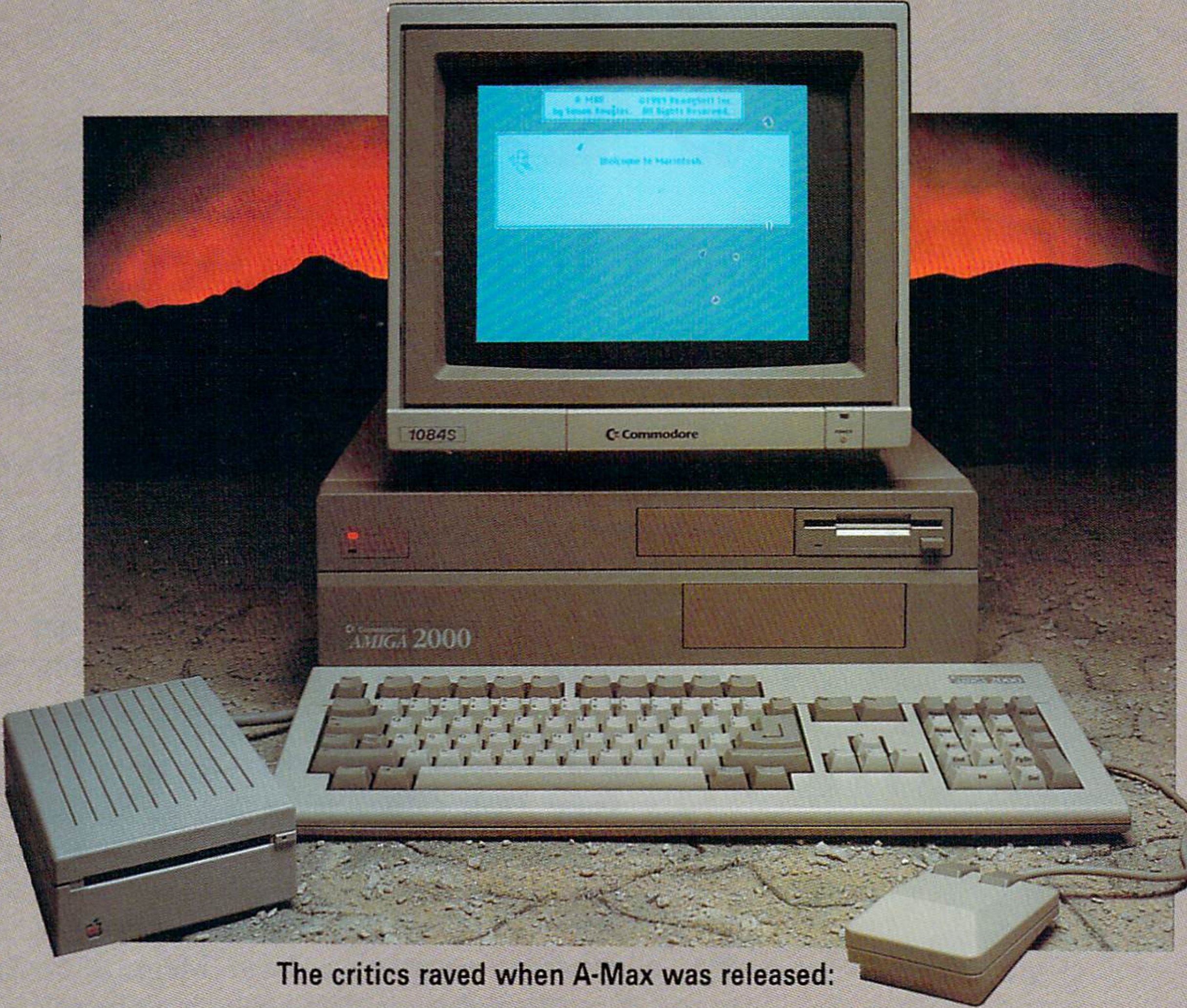
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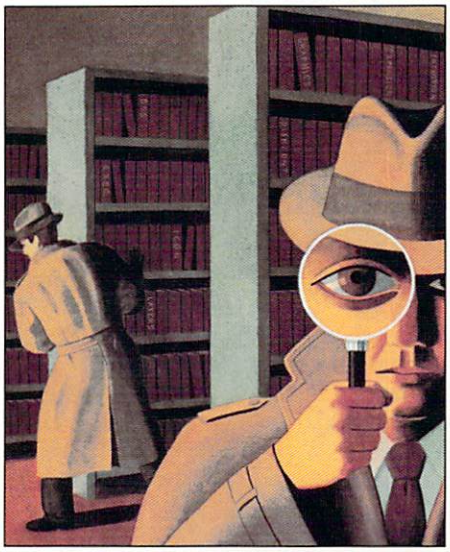
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FEATURES

ARTICLES

COLUMNS

COVER: PHOTOGRAPH BY ED JUDICE; ILLUSTRATION BY JACK TOM.



"Clues to Programming the Amiga"—p. 22
Who did it, Where, and How? [*See the Solution at the bottom of this page.*]

DEPARTMENTS

REVIEWS

GAMES

SOLUTION: Amiga C and BASIC programmers, in the system libraries, with some development tools.

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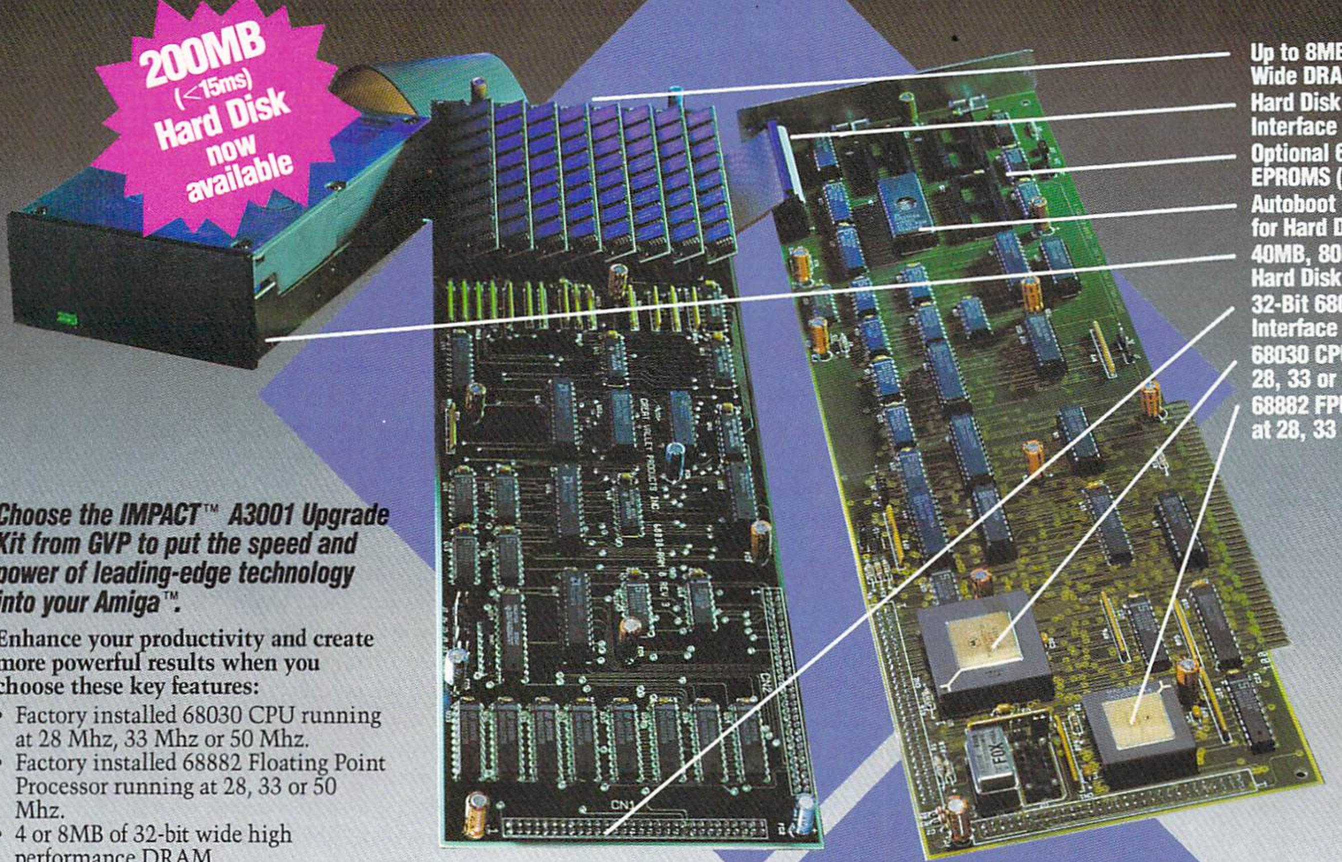
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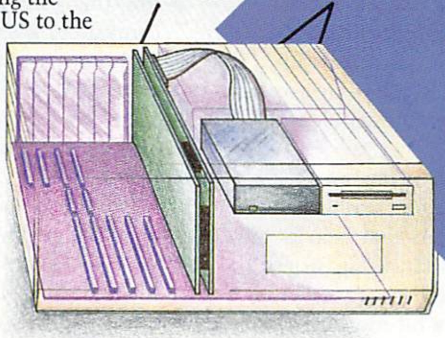
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CHIEF CONCERNS

Matters of the moment: ADA aweigh, piracy, and viral infection.

"We should have made an example of this jerk, and put him in the slammer."

USUALLY THIS COLUMN spends 12 or so consecutive paragraphs discussing one topic. Many subjects are worth the effort, and some people even read these columns to the end. Other topics are important, but deserve far less space. So this month we'll introduce a new style and talk about a lot of different things with no particular connection except that they somehow relate to the Amiga.

ADA on its way: As you probably know, the Amiga Developers' Association has officially been formed. Although it sounds like a real organization (board of directors, name, legal status, etc.), it is still an infant. Like any youngster, it needs nurturing and, perhaps, even a little discipline. But mainly it needs participation, ideas, and effort.

Here's the skinny: ADA Chairman Mike Halvorson of Impulse is currently in the midst of an aggressive membership drive, and is also putting together an extensive position paper on Amiga technology that will be distributed to the computer and mainstream press. The timing couldn't be better. Journalists now perk their ears at the mention of the Amiga, and the old Commodore image is slowly but inexorably fading.

If you've got any bright ideas for Mike, and the will to back them up, I'd suggest you drop him a line or give him a call at Impulse in Minneapolis.

Another swell idea: A few months ago, I called upon AW readers to write to particular publications that heavily influence PC buying. So far, it has worked. I've heard from people at those publications who are now a bit more curious about the Amiga. And I've seen some great letters published. Let's keep it up. Heads are turning. Why not twist them a little more, eh?

Copy protection and piracy: In the PC market, copy protection is obscene. There is a huge market of responsible business people willing to shell out $495 for a word processor. If you can't make it in the market, it's your fault.

Unfortunately, our market is different. Is is smaller. Prices are lower. And software vendors need revenues to develop new products and upgrade older ones. Software piracy hurts these firms, and then ultimately hurts users as software dries up. The problem is that all forms of copy protection so far devised not only intrude upon the honest user, but also are not effective in preventing ingenious pirates from making copies.

We need a compromise that serves both users and vendors. Maybe the ADA could help both parties decide on a uniform standard—at least for now. Later, when we have an installed Amiga base equal to IBM's, we can get rid of all the protection. Write us and let us know what protection, if any, you'd be willing to accept and we'll pass it along to the ADA.

No mercy: The probation given to Robert Morris has got me hotter than an Eskimo at Spring Break. As you may recall, this joker gooped up thousands of computers with his sneaky, slimy virus, and then got famous for it. So we give this yahoo probation? We should have made an example of this jerk, and put him in the slammer. Viruses are an invasion of privacy, destroy property (information *is* property), impair your ability to work, and weaken the market for shareware and PD software. Let's put low-lifes like Morris in jail—not on the front pages of computer magazines. ■



REPARTEE

Comments, complaints, and concerns

from AmigaWorld *readers.*

KUDOS FOR COMMODORE

IN RESPONSE TO the letter from Brian G. Wilson (Apr., p. 8), I'd like to relate my experiences with Commodore. Last summer I wrote a letter to CBM president Harold Copperman, voicing concerns over the future of the Amiga. A few weeks later, I was surprised to receive a reply from Mr. Copperman in which he gave me a rundown of his plans to improve the Amiga's market position in coming months. About the same time, I wrote to Amiga Product Manager Keith Masavage telling him what I would like to see Commodore produce in the way of Amiga products. A month later I got a personal and informative letter from him as well.

I believe that the Commodore of old is gone, replaced by a dedicated and aggressive team determined to push the Amiga back into the limelight. The company still has a long way to go in terms of customer support, but has made astounding strides over the last year. I have the greatest faith in Commodore's new management.

Jeff James
Roy, UT

IN RECENT ISSUES, I have read a lot of complaints about Commodore and its advertising strategies. I agree with most of the criticisms and see that many are constructive, but let's have a little more positive reinforcement out there. Commodore is at least *trying*! I'll do my part right here by saying "Thanks" to Commodore for its effort in promoting the Amiga.

Mike Manzano
Stuttgart, W. Germany

ON THE CHIP LIST

WITH ITS 32-BIT bus—something that should have been available long ago—the A3000 looks great. As a professional, though, I need more colors and *real* ray-tracing. These are things that should have been incorporated into the A3000. I can't wait another year for Commodore to come out with a graphics board. If the only way to add better graphics and more colors is to make changes to the hardware that will render it incompatible with some software, so be it. This is a price we can pay for progress—look at the Macintosh line. Better software will be written. More and more of late, I find myself using other computers to get the effects I desire. I hope this situation changes; I do enjoy working with my Amiga.

Steven R. Collins
Graterford, PA

EVERYWHERE YOU LOOK on the A3000, you can see that Commodore focused on high-speed throughput. Unfortunately, however, vestiges of the 16-bit era remain: The Paula, Agnus, and Denise chips are not just accessories, but the cornerstones of the machine. In 1984, these chips were state of the art, but chip design and manufacturing has advanced significantly since then. A completely new 32-bit chip set is essential to Commodore's future in the professional PC market.

I suggest adding 32-bit data paths throughout, a 28.56 MHz clock, 8192 24-bit color registers, and four 16-bit channels for CD-quality stereo sound. If CBM can't produce these, it should ally itself with a mainstream chip manufacturer. The importance of such a set is so obvious that Commodore *must* be working on it. If not, my kids will continue playing games on the A500 while I am stuck for life using Intel-based PCs at work.

Mark Shackelford
The Colony, TX

ALTHOUGH THE A3000 is a significant improvement over other Amiga models in terms of throughput, its lack of improved custom chips is disappointing and makes for a bottleneck in the system. Amiga owners have long been crying out for more resolution and colors. If all Commodore can do is suggest we buy upgrade cards, then all I have to say is "Sayonara." Newer systems with superior graphics and sound will begin emerging soon—some may even implement multitasking. Are you listening, Commodore?

Harry Jordan
APO, New York, NY

NOW AND THEN

READING YOUR FEATURE on the new A3000 ("Welcome to a New Generation!," Jun. '90, p. 19) took me back to when I bought my first A1000. After four years of self-training, writing proposals, and much persuasion, I convinced the administration of Laramie County Community College to add computer graphics courses to our curriculum. Last fall, I started my first classes with an A1000, five A2000s, and two printers. This spring, we offered six graphics courses using an A2500, 10 A2000s, and four printers.

These classes fill up almost immediately each semester, and we plan to add courses in advertising and other design disciplines. More Amigas are arriving, too: The LCCC library computer lab will add six A2000HDs and an inkjet printer for the fall '90 semester. Ours is the only curriculum and lab like it in Wyoming and possibly in the region.

Bud Sills
Professor of Art, LCCC
Cheyenne, WY

Send your letters to: Repartee, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458. Letters may be edited for space and clarity. ■

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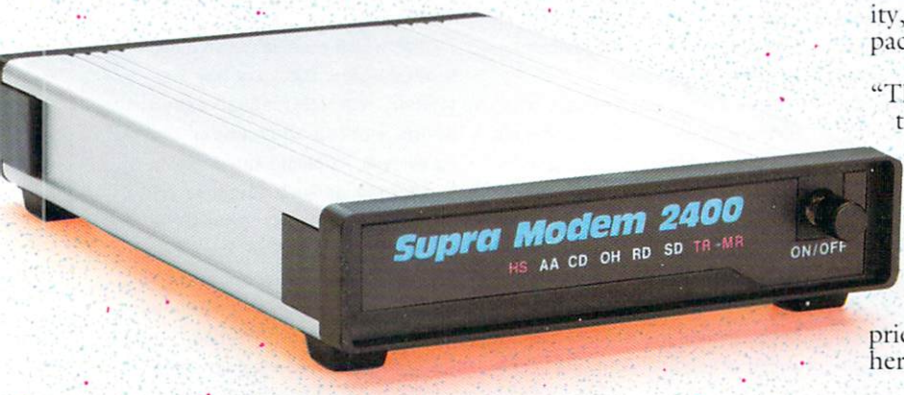
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NOTEPAD

Compiled by Barbara Gefvert Tyson

New Student or Teacher?

DANTE, ERASMUS, AND COPERNICUS once trod the ancient halls of the University of Bologna, Italy. Now the Amiga has gained admittance, thanks to the repeated recommendation of Dr. Raffaele Cocchi, tenured researcher of foreign languages and literature in the English and American Department.

For three years, Dr. Cocchi waged a three-pronged campaign: to get Amigas into the University, to convince Commodore to improve the Amiga narrator so it will speak European languages with the proper rhythm and accent, and to develop Amiga software useful to studies of language and literature.

He claims victory on two fronts. The University of Bologna now has five Amiga computers, one donated by Commodore Italia for Cocchi's research. With the assistance of Vanio Preti, a senior student of statistics and a skilled programmer, Cocchi created three highly useful programs in both Italian and English. Literary Amiga is an extensive program for analyzing literature and poetry that produces detailed, neatly printed concordances and statistical tables of various word patterns, frequencies, and locations. Polyglotti speaks text in five languages with greatly improved speech quality and shows the text transcribed in IPA (International Phonetic Alphabet). The Right Editor is a text editor that writes from right or left and includes fonts for Hebrew, Arabic, Russian, and IPA. To help other scholars, Dr. Cocchi is negotiating with Risorse Per La Didattica to distribute the software in Europe.

For more information on Dr. Cocchi's projects, you can contact him at DIPA Lingue e Lett. Strani, Strada Maggiore, 45, 40125 Bologna BO, Italy.

—Sue Albert

NEWSPAD

Upsetting the Applecart

Is it true? The Amiga figured prominently at. . .AppleFest? In response to the waning Apple market, the premiere Apple show changed its name to ComputerFest, included Amigas and IBMs, kept its sights on the low-end home and educational markets, and debuted in the greater New York City area May 4–6.

Commodore's large booth, positioned at the main entrance, bustled. Surrounding an A3000, which spotlighted Workbench 2.0, were A2000s demonstrating applications for curriculum development, the arts, thinking and writing skills, video, music, classroom networking, and more. The Philadelphia College of Osteopathic Medicine showed off its Dynamic Spine interactive tutorial (created with INOVAtronics' CanDo). Meanwhile, Roland provided a backbeat with a complete music synthesizer/sampler/sequencing package built around an A500, and CBM representatives distributed information on the special pricing program for education.

At the Interactive Multimedia seminar, CBM's Roy Strauss demonstrated AmigaVision, integrating animation, sound effects, and laserdisc sequences while multitasking. The audience was stunned not only by how easily the authoring system works, but also by the price of the hardware/software bundle. The Expanding World of Computer Graphics seminar featured a ShowMaker (Gold Disk) presentation and an analysis of how the images and animations were created.

With Apple concentrating on high-end Macs and IBM holding out on its rumored low-cost machine, Commodore has an opportunity to penetrate the educational and home arenas. Its bundling of AmigaVision and support for other authoring systems can help solve the remaining problem: lack of educational and home/office software.

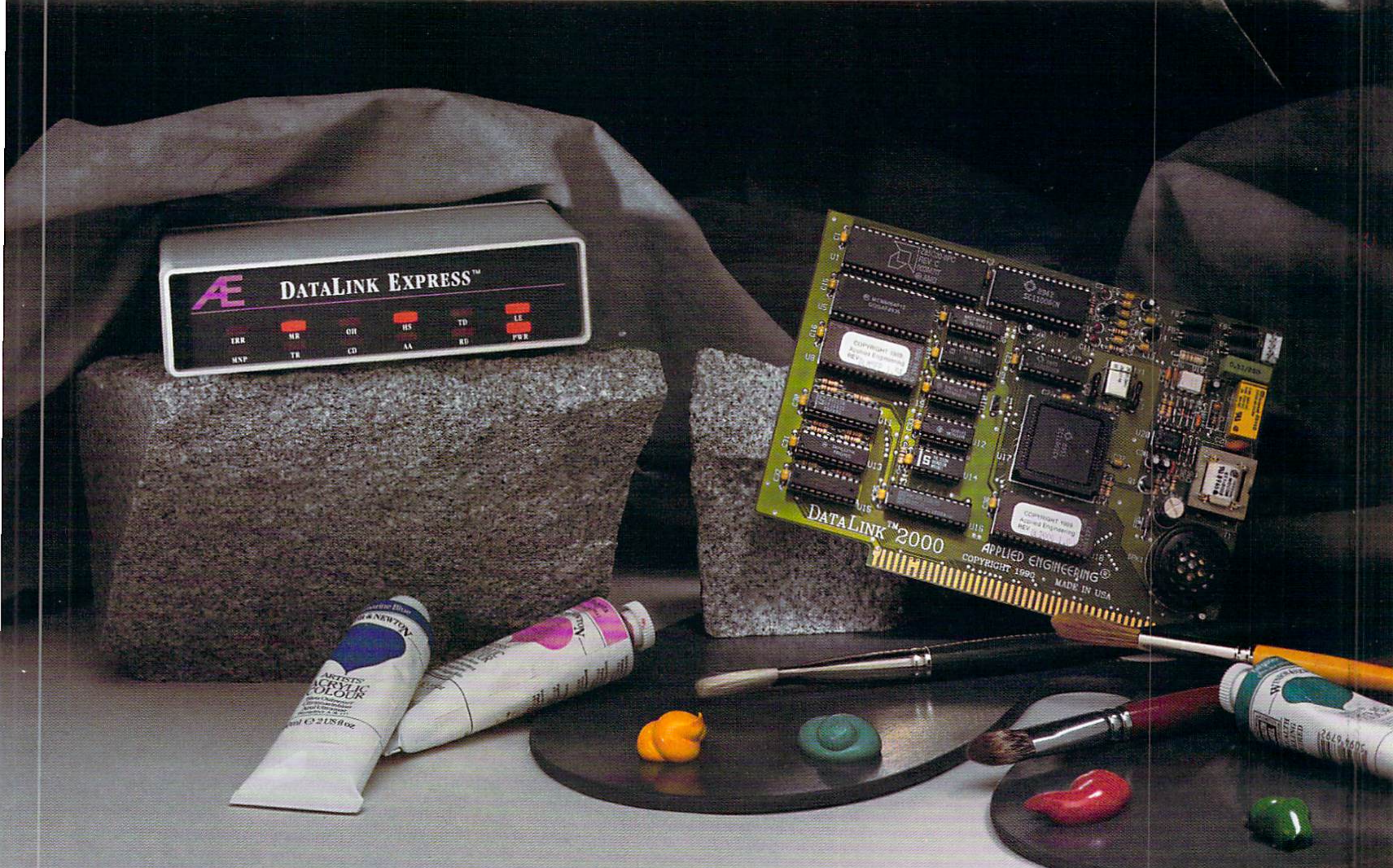
—Steve Gillmor

The US Treasury Department's award of a five-year Departmental Microcomputer Acquisition Contract II (DMAC) to Sears Business Systems spells success for key subcontractor Commodore. The estimated $400 million deal is Commodore's first victory in the federal marketplace.

CBM, which established an office in Washington, D.C., just last September, will offer 68030-based Amiga workstations under the agreement. "Commodore's ability to offer the Amiga's advanced capabilities at a highly competitive price was certainly an important part of the winning equation," stated CBM Federal Systems Group Director Randall Griffin.

The Amiga is gearing up for a number of consumer/trade shows, including the World of Amiga, to run Sept. 15–16 in Valley Forge, Pennsylvania (call 416/595-5906 for details) and AmiEXPO, slated for Oct. 5–7 in Anaheim, California (dial 914/741-6500).

—BGT



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REVIEWS

UltraDesign

Three-part harmony

By Ron Bissett

ULTRADESIGN, THE LONG-awaited, computer-aided design (CAD) system from Progressive Peripherals, impressed me from the start with its logical design. Its features are on a par with other professional-level CAD software, and the dual-disk program is well documented in a 348-page manual, which begins with an easy-to-understand explanation of object-oriented graphics and the basics of UltraDesign.

The program's hard-drive installation program is wonderfully simple and works perfectly. You just create a directory on any partition and double click on the HDInstall icon. In a few moments, you are ready to go. You can move the default locations for the various support files by changing the UltraDesign.config text file.

In the main UltraDesign window, you will find icons for the three program modules: UltraDesign, CADverter, and PasteUp. Through the UltraDesign module, you can create, edit, organize and set up drawings for output. Importing files, saving drawings in IFF format, and even creating hatch files takes place in CADverter, while plotting is done from the PasteUp module.

Input Here

When you enter the UltraDesign module, a title screen appears, telling you that you are about to put "Thought into action. . .At the Speed of Light" (always a secret desire of mine). Just select the Draw option from the pull-down menu and then choose Lines, Circles/Ellipses, Text, Dimensioning, or Hatching/Filling. Selecting any of these items summons to the far left of the screen a set of icons associated with that drawing mode. The ability to position drawing entries precisely is essential, and UltraDesign's placement options—Endpoint, Midpoint, Perpendicular, Center, Intersection, and Stored Points—are the minimum acceptable for professional use.

The program's lack of menus to select digitizing pads is an omission that should be corrected, even though there is provision for efficient production by using both menus and keyboard commands.

When using menus, you cannot enter x and y coordinates from the keyboard. You can perform most mouse functions, however, by making keyboard entries after activating a Shell-like dialog window. The only way to use the dialog window and the graphic interface simultaneously is either to enter one dialog command at a time or several together in a script (text file) using the menu command Take. But, while this is powerful, it is not a completely smooth process.



YOUR TURN!

With a turbo board and extra RAM, UltraDesign runs very well, but on a stock 1-meg Amiga, it is far too slow. UltraDesign has many good features, including a great interface, printer utility, and file-interchange program. It lacks other features, however; I find myself using X-CAD Professional to draw, and then using UltraDesign to print.

Chad Kielkopf
Sturgis, MI

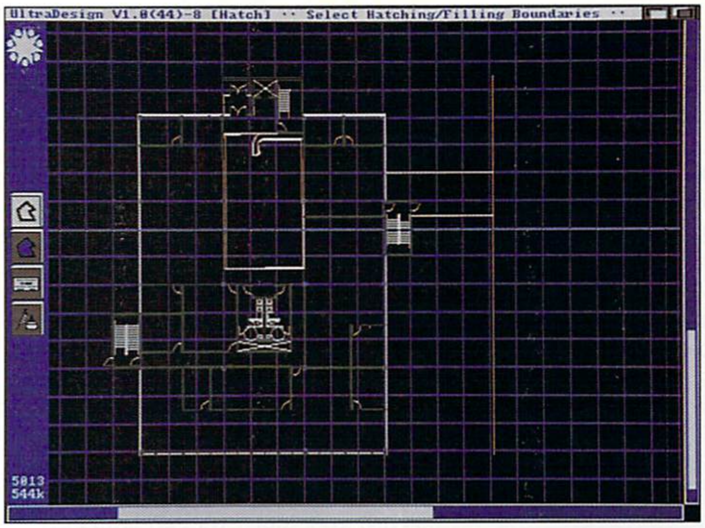
The Launch command starts an ARexx procedure which is then executed in UltraDesign. The sample Dialog/ARexx script supplied with the program is an indication of this feature's power. Programming ARexx routines requires such extensive effort that most individuals will not use this feature, but the promise of third-party customized applications gives it great potential.

Other powerful features are the dynamic Zoom and Scroll options. With these, you can zoom into one section of the drawing to identify a point, then zoom out, pan the screen (using the bars on the bottom and right sides), and zoom back in to digitize another point. The range of the zoom is almost infinite. You control zooming by the pull-down menus or keyboard, and you can easily program zoomed views into keys 1–9 on the numeric keypad.

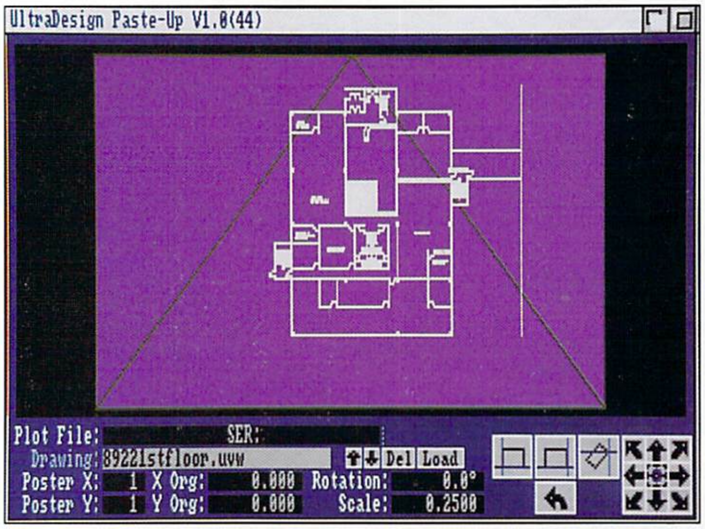
Hard Currency

Creating an object in UltraDesign involves first sketching it on screen in the default green color. At this point, your object is not part of the drawing file, so you can alter it. To make the entry part of the file, click on the quill-and-bottle icon. The object will begin to flash red. This blinking, which can be annnoying but cannot be turned off, indicates the "current" object. Using the Cursor-right and -left keys, you can move backward and forward through the drawing list to select another object and make it current.

Another way to reassign "current" status is to highlight Edit Current Object on the menu and Find Object on the submenu, and then select another object in the drawing. Only one entry can be current at a time, and you can return the current entry to the sketch state by clicking the eraser icon. This is a novel



Draw a shape, choose from over 40 hatch patterns, and click to fill.



Scale, rotate, and position drawings individually in the PasteUp module.

approach to object selection. I appreciate its keyboard alternate, as repeated trips to the pull-down menus make object selection somewhat slow and clumsy.

Only the current object can be directly added or removed from the Clip buffer. To manipulate noncurrent objects, you must place them in the Clip buffer by highlighting Clip Clipping Box on the menu and then choosing one of three different object-selection methods from a submenu.

This arrangement involves an extra step not required by other programs; when erasing several small, connected objects, you must zoom and pan many times to identify things. The Find Object function is of little help here, because it can identify only one object at a time. The developer needs to insert a method for finding several objects at once without using windows.

Lined Up

The program defaults to drawing lines, and the Draw Lines icon list at the left of the screen has several great features. One of the most impressive is the Multiple Line Mode icon. It draws any number of lines, evenly spaced at any distance you specify, parallel to a line you draw. A nice surprise, and a boon for architects, is the fact that when you draw a zigzag in this mode, the program automatically trims any overlap where the parallel lines turn and intersect. Other line options are arrows, boxes, polygons, lines parallel, perpendicular or at other angles to a given line, as well as horizontal or vertical lines. Be careful with the last two: The system crashed whenever I tried to force a vertical line in Horizontal mode.

The Draw Ellipse command brings up the Circle/Ellipse icon menu, and you can determine placement by setting the centerpoint, radius, and starting and ending angles. After you sketch an ellipse and before you render it, you can rotate it around its centerpoint from the icon menu. When I tried to use the Edit Razor command to break a circle into two arcs, nothing happened. A call to customer support revealed that ellipses and circles do not support this command, but that programmers are busy correcting this shortcoming.

UltraDesign doesn't skimp on fonts; there are 18 styles available, and you can create your own as well. The program also supports auto-dimensioning for vertical, horizontal, or angular distances between two points. There is no provision for measuring or dimensioning angles or arcs, but otherwise the dimensioning function has all the necessary features, including the placement of dimensioning text and the units of measurement to be used. UltraDesign does not automatically update dimension measurements when you change an object's size.

One of my favorite UltraDesign features is the Draw Hatching/Filling option, which provides 40 patterns that you can output to a pen plotter. To fill a polygon with a hatch pattern, simply draw the polygon and click inside it—the hatch fills in automatically. Sadly, patterns are incredibly slow to render, a fact that becomes increasingly irritating every time you redraw. On the positive side, this gave me lots of time to read the manual and discover that the programmers mercifully provided an option to substitute a quick, simple color fill for the hatch.

Transfer Station

The CADverter module is a slick program for importing files from other for- ►

mats, including AutoCADD's widely used Drawing eXchange Format (DXF). As with any DXF conversion program, not everything translates directly, but CADverter is the easiest DXF converter to use that I have ever seen. Just highlight the Load DXF Interchange menu option and select the appropriate DXF file from the pop-up window. The drawing will soon appear on the screen, where you can edit it before saving it in Ultra-

> ***YOUR TURN!***
>
> UltraDesign makes hard-drive installation a breeze, and the manual fully describes the directories used. CADverter is top-notch: I converted many formats, including a Draw 2000 file saved from Modeler 3D, without a hitch. The interface is extremely confusing, however, and the manual badly needs a tutorial. Once you get used to the tools, they are helpful, but learning them is difficult. Printer output is outstanding: My laser printer produces drawings that look like plotter output! I've been able to induce only one guru—by failing to make the proper disk assignments.
>
> ***Jeff Grimmett***
> *San Diego, CA*

Design format. You can also create DXF files from UltraDesign files by using the Save DXF Interchange selection and supplying the proper pathnames.

UltraDesign can also read IntroCAD (Progressive), Aegis Draw (Oxxi), Hewlett-Packard Graphics Language (HPGL), and Roland DXY files, and can save drawings in IFF format. I wish it could also write in Aegis, Sculpt, and other Amiga formats.

On the Outs

The PasteUp program is another departure from the usual CAD output routines. It lets you load any number of drawings and place, scale, or rotate them individually, using either the keyboard for exact positioning with x and y coordinates, or the graphic interface.

The Setup option lets you choose from many output-device drivers, including Hewlett-Packard, Houston Instruments, Roland, and PostScript plotter drivers. The Houston Instruments device driver did not list our DMP-61 plotter, but by calling customer support, I found that all I needed to do was alter the X Inch/ Step using the Change Setup feature to make it work.

In outputting a drawing containing some hatching, I noticed that the plotter handled the main body of the drawing as fast as the PasteUp program sent the data. (The program sends each line to the plotter as it renders it on screen.) When it reached the hatching, however, the plotter ground almost to a halt. I could find no Abort command, and turning off the plotter had no effect on the PasteUp program. Resigned to my fate, I timed the task. This 3 × 5-inch hatched area took over two hours to plot! My frustration prompted me to invest in a 68030 accelerator, with which I was able to test UltraDesign's coprocessor version. Everything speeded up, but hatching was still too slow.

UltraDesign is a good piece of software, and you can put it to work almost instantly by using the pull-down menus. You can quicken your pace using keyboard equivalents, but you will probably only *approach* the Speed of Light—not equal it. The Dialog and ARexx features allow versatility and open many possibilities for UltraDesign. The program's major drawback is its inability to output UltraDesign drawings to other Amiga graphic programs for 3-D manipulation, desktop publishing, or video production.

UltraDesign
Progressive Peripherals & Software
44 Kalamath St.
Denver, CO 80204
303/825-4144
$299.95
One megabyte required.

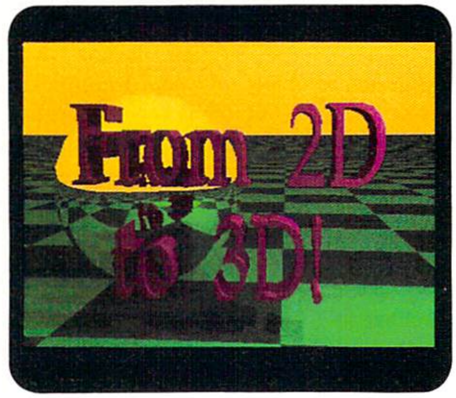
AutoScript

Draw on the count of 3-D

By Mitch Wells

I SUSPECT THAT many Amiga artists who are comfortable with two-dimensional paint-and-draw programs are apprehensive about three-dimensional rendering programs. Although they would like to integrate 3-D objects into their work, they are intimidated by the prospect of creating them from scratch.

AutoScript by Computerall Services is not the only Amiga program capable of converting 2-D artwork into 3-D pieces. But while other conversion utilities interface with paint programs, AutoScript converts PostScript output from draw programs such as Gold Disk's Professional Draw (so far the only such program for the Amiga, although others are promised), and also from three programs for the Macintosh and MS-DOS platforms. (To use Mac and MS-DOS output, you must convert it to Amiga format with a platform-transfer utility.) AutoScript can output to two modeling packages—Sculpt-Animate 4D (Byte by Byte) and Turbo Silver (Impulse)—and, with the help of Syndesis' Interchange, to other formats as well. It also directly supports the IFF-to-3-D converter, DigiWorks (Access Software).



Converted EPS file filled with DigiWorks, rendered in Sculpt 4D.

With the abundance of paint programs on the market and the established software for getting IFF output into three dimensions, why would you want to bother converting PostScript files? One reason is that draw programs provide tools that facilitate quick logo design. Also, because draw programs define objects mathematically, they produce ultrasmooth images that retain integrity when resized.

Images produced in paint programs, on the other hand, are defined in terms of bitmaps, and when bitmapped images are enlarged, their jagged edges are exaggerated. Finally, while working with draw software can be more time consuming (screen refreshes take longer), it can be easier and more precise. (You

can, incidentally, import bitmap images into draw software, and trace them to produce PostScript objects.)

Fill Me In

Using AutoScript is simple. Through pull-down menus, select an output format (Sculpt, Silver, or DigiWorks) for your object, give it a file name, and load the PostScript file. AutoScript draws an outline on the screen as it creates the 3-D object. (Although most draw programs give you control over color and shading, AutoScript converts only outlines.) It then saves the outline to disk. You can load this outline into your 3-D program, but before you can render it, you must fill it in with polygons.

The easiest way of accomplishing the fill process is either to use Sculpt-Animate's automatic-fill function (Turbo Silver offers no such convenience) or to save the outline as a DigiWorks snapshot. I strongly recommend using DigiWorks. It is much faster; in fact, AutoScript provides support for DigiWorks precisely because of its ability to quickly fill objects with polygons. A single letter T in the Palatino font, made with Professional Draw and converted with AutoScript, took hours to fill in Sculpt-Animate 4D, but less than two minutes in DigiWorks.

You can take your filled outline into the third dimension either by extruding it to give it depth, or by spinning it on an axis to create an object whose surface is defined by the 2-D line. Because it works from outlines, AutoScript does not handle complex objects well—creating a 3-D automobile would be difficult, for instance—but 3-D logos and objects for fly-bys are incredibly fast and easy to produce with AutoScript.

AutoScript can also work backward, converting wireframe Silver and Sculpt scenes (you determine the angle and size of the view while in the 3-D program) into two-dimensional clip art. The 2-D output is not in PostScript format, however, but in Encapsulated PostScript (EPS) form.

EPS does not show up on screen when imported into your desktop-publishing program; the only way that you can see an EPS file is to output it to a PostScript printer. (AEPS—Amiga Encapsulated PostScript—which tags EPS files with an IFF representation of the EPS image, is not widely used. Until this format is implemented, desktop-publishing programs will probably not display EPS files on screen.)

Finicky for Formats

There are a few drawbacks to AutoScript and the whole conversion process, and, thankfully, the manual clearly points these out. AutoScript does not like complex Pro Draw files, and is specific about the size of the PostScript files it handles, especially when converting to DigiWorks format. A tree that I created in Pro Draw and filled using DigiWorks, for instance, came through AutoScript distorted. Also, while AutoScript provides four conversion resolutions for PostScript files, I experienced unpredictable results when outputing Pro Draw images in anything but the lowest setting. Points that came through properly connected in the Course setting were unconnected ►

in the Medium setting.

Except for these problems, AutoScript works fine with all the programs listed in the manual (Pro Draw, Aldus Freehand, Adobe Illustrator '88, and LetraStudio, by Manhattan Graphics). I tried it with other PostScript programs (including Gold Disk's Professional Page desktop-publishing system), however, and found it does not recognize all PostScript files.

AutoScript is noncopy-protected, easy to use, and comes with concise, well-written documentation that's complete with tutorials. The technical-support representative assured me that an upgrade will provide a complete interpreter to convert all PostScript output and fix the deficiencies I found. AutoScript is a no-frills package that, for the most part, does what it promises.

AutoScript
Computerall Services
3 N. Walnut Ave.
New Hampton, IA 50659
515/394-3778
$129.95
No special requirements.

The Serial Solution

25 + 9 = expandability

By Sheldon Leemon

KNOWING THAT CHECKPOINT Technologies calls its dual-serial card for the Amiga 2000 or 3000 The Serial Solution, you might find yourself wondering what the problem is. After all, doesn't the Amiga already have a serial port?

Well, part of the problem is that one serial port is sometimes not enough. Because the serial port is the only two-way communications port the Amiga shares with IBM-style computers, PC serial peripherals are the easiest to adapt to the Amiga. As a result, there are a disproportionate number of peripherals that use the Amiga's serial port: input devices like audio digitizers, optical scanners, touch tablets, touch screens, and wireless mice; output mechanisms like printers, plotters, and film recorders; and control interfaces for MIDI devices, video recorders, and video-disc players.

While a serial switch box lets you plug in multiple devices at the same time, it does not let you use them simultaneously—something you need to do in order to take full advantage of the Amiga's multitasking capabilities. A multimedia author, for example, may want to use a laser-disc player and a touch screen at the same time.

The other part of the problem is that the Amiga's standard serial port is fairly slow and has no input buffer. This makes it difficult to obtain reliable transfers at speeds as low as 9,600 bit per second (bps), particularly when using a 16-color hi-res screen. The Serial Solution solves this dilemma by providing a 4-byte hardware buffer for each port, so as to make the board suitable for use with high-speed modems and high-speed serial networking.

The Long and Short of It

Checkpoint's Serial Solution is a full-slot plug-in card. Unlike other multiserial cards, it provides one full-size, 25-pin D-shell connector. (There is not enough room on the mounting bracket for two full-size connectors.) This connector—unit 0—is almost identical to the standard serial port: It even supplies power on the same pins as the Amiga's port. That's important, because it means that MIDI adapters for the Amiga 2000 work with the Serial Solution without modification.

The other serial port—unit 1—uses a 9-pin D-shell connector that is configured to use the same cable as the serial port on IBM AT-type computers. You can program both ports on the board to any of the speeds (up to 125,000 bps) used by the Amiga port, including the oddball MIDI speed. In fact, the Serial Solution board goes to the extraordinary length of including a separate oscillator to produce the exact 31,250 bps speed required by MIDI devices.

It should be noted, however, that according to the manual, you can set only one non-standard rate (above 38,400 bps) at a time. This means that both ports cannot be set to different high-speed rates simultaneously, although both can use the *same* high-speed rate.

The Serial Solution includes both Exec and DOS-level software support. The Exec device driver, ckptss.device, is similar to the standard Amiga serial.device, and you install it by dragging its icon into the Expansion drawer. The main difference between this device driver and the standard one is that it supports unit numbers higher than 0 (0 and 1 if you have one board installed; higher numbers if you have more boards). The Exec-level driver is used directly by programs that access the serial port.

Some terminal programs—such as Online! Platinum (Micro-Systems Software), A-Talk III (Oxxi), Baud Bandit (MichTron), and the shareware program JRComm—support serial drivers other than serial.device and can use either of the Serial Solution ports without modification. Checkpoint covers programs that do not directly support alternate serial devices by providing a couple of methods for accessing their Exec-level driver. The first involves "patching" these programs—automatically replacing the text string "serial.device" with the string "ckptss.device"—using a program called ZapPort.

If you do not wish to alter your program files on disk, you can use the supplied NewPort utility, which creates a small (under 1K) launcher program to load the terminal software, replace the text string in memory, and then execute the program applications. This approach has the advantage of letting you operate either through the default serial port or through unit 0 of the Serial Solution without taking up as much disk space as two full program versions.

Whether you use NewPort or ZapPort, you should be aware that the unit number of the serial port does not change. Programs that do not let you select a unit number, then, work only with the 25-pin port—a significant drawback.

AmigaDOS software support is provided by a handler, tss-Handler, which corresponds to the DOS SER: handler. It enables you to mount the SER2: and SER3: devices, which you can use to perform any normal AmigaDOS operation, such as copying a file or printing to one of the serial ports. You can specify default communications settings for these DOS-level devices by adding a Tool Types entry in the icon for the serial driver. The Serial Solution does not include a handler for unbuffered serial I/O like the AmigaDOS AUX: device. This means that you cannot use its serial ports to open up a remote CLI console

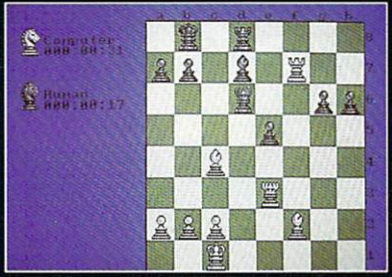
Continued on p. 80



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Democratic

AMIGA PROGRAMMING IN THE NEW AGE

By Louis R. Wallace

Remember those first computers? Mammoth, room-sized colonies of glowing vacuum tubes, they needed the continuous ministrations of entire cults of white-clad techno-priests working in perfectly sterile conditions to keep them running. Programming them was an exercise best left to your neighborhood nuclear physicist, as it involved such actual hardware modifications as removing a wire, carefully threading it through the machine, and plugging it in somewhere else—just to change a byte. Making a modest alteration in the program code meant calling a staff meeting; replacing the operating system (such as it was) required an Act of God.

Of course, it got better with time. Programming with wires wasn't any fun, so some potential Nobel Laureate invented the dip switch—a revolutionary development because it also involved a hexadecimal keyboard that allowed you to enter numbers directly into the machine. All you had to do was flip some dip switches to define an address and then carefully type in the value for that byte. It didn't take too long before the dip switches themselves were replaced by the numeric keyboard—allowing you to enter both the address and the value in relatively easy fashion. At this point the nuclear-physicist type lost his cushy job because now everything could be done by the white-clad techno-priests in their clean rooms.

Further evolution spawned such remarkable user developments as paper tape, punched cards, and alpha-numeric keyboards. Soon video terminals began appearing, the techno-priests were laid off, and a new professional appeared on the scene—the Programmer. Highly trained, this exalted being was able to say such things as "Opcode" or "Fortran" in meaningful ways during a conversation and, if provoked, to unleash a diatribe involving such arcane topics as object dumps of core memory. A breed apart, this individual would bequeath us such magnificently obscure legacies as Cobol; he would serve as the unpleasant stereotype of the computer programmer for an entire generation.

The advent of the microcomputer changed computer programming dramatically—in two ways. With inexpensive desktop systems readily available, the ordinary engineer or physical scientist could now enjoy easy access to a computer—and the opportunity to program with it. This spurred a rich, accelerated growth in the development of more powerful, sophisticated, and flexible computer languages. Besides the low-level assembly language, there was now a

'Development'

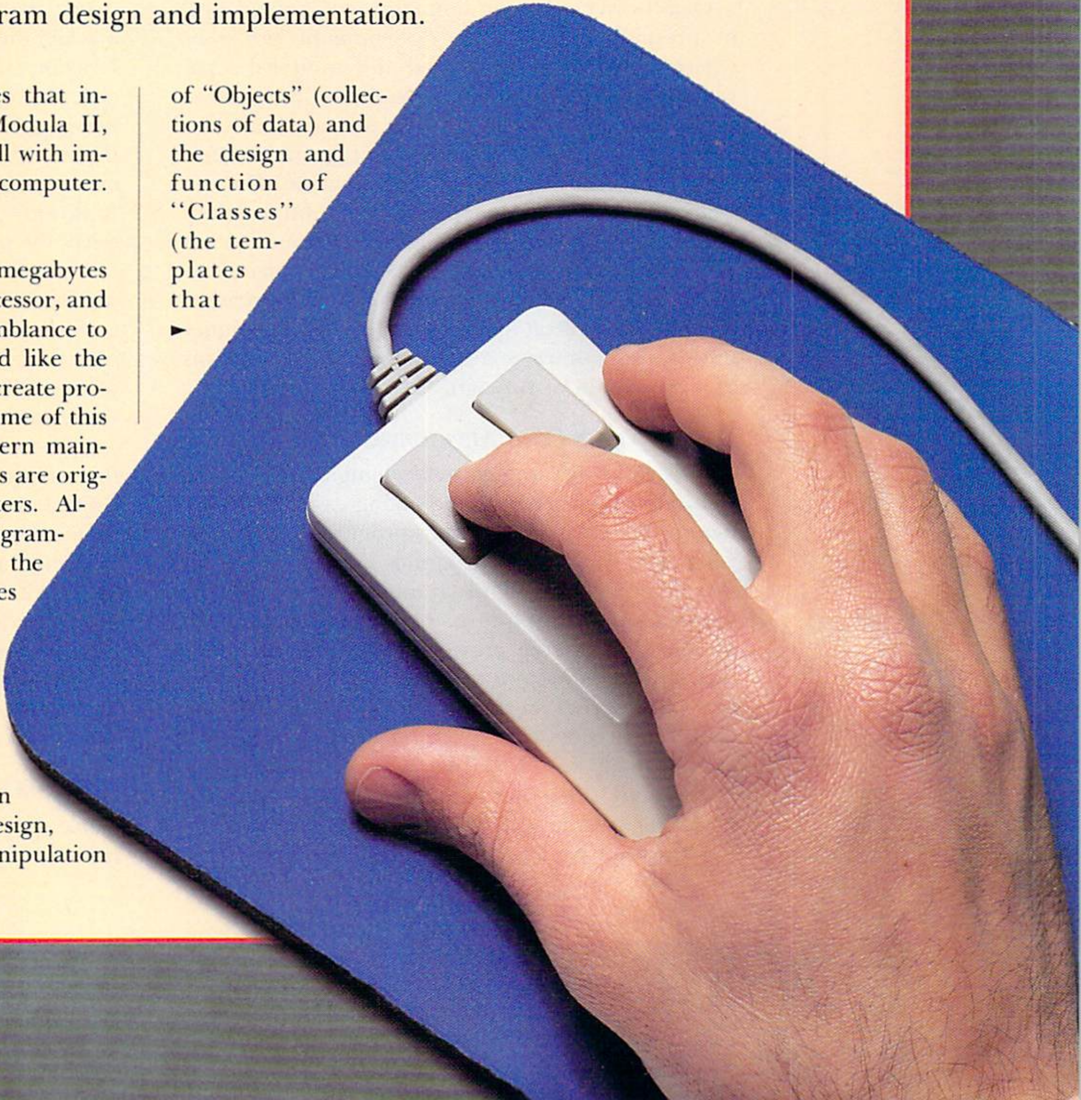
The fact is that programming isn't just for "programmers" anymore. The approaches embodied in such Amiga software as multimedia-authoring systems and other application-generating packages represent a brand-new way of thinking about programming. Just as the user interfaces of today's computers reflect a revolution in making computers more accessible to a larger public, so too have current development techniques made programming more intuitive, easier to write, and open to wider participation by ordinary computer users. *AmigaWorld*'s Senior Editor of Technology Lou Wallace takes a broad look at current Amiga programming trends and how they evolved from earlier, more traditional approaches to program design and implementation.

diverse collection of high-level languages that included Fortran, Cobol, BASIC, Pascal, Modula II, Forth, Ada, Lisp, Prolog, Logo, and C—all with implementations on the ubiquitous personal computer.

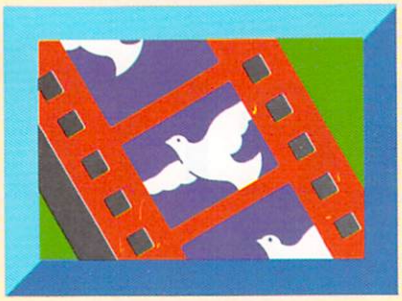
A New Orientation: OOP

Today my Amiga computer, with its many megabytes of RAM, hard disk, high-speed 68030 processor, and graphical user interface, bears little resemblance to the computer dinosaurs of the past. And like the hardware itself, the methods by which we create programs have continued to evolve. While some of this progress originated in the world of modern mainframe systems, the most interesting aspects are original developments for desktop computers. Although almost every major existing programming language is currently available on the Amiga, the development of new approaches to program creation continues—and the results will undoubtedly be appearing on the Amiga for some time to come.

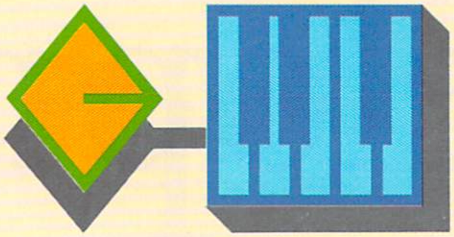
For example, with Lattice's C++ package, Amiga C programmers can utilize the many Object-Oriented Programming (OOP) design and implementation techniques. OOP (and Object-Oriented Design, OOD) is concerned primarily with the manipulation of "Objects" (collections of data) and the design and function of "Classes" (the templates that ►



PHOTOGRAPHED BY ED JUDICE



ANIM



IF THEN



SPEAK

define the objects). It involves a different philosophy from that of "Top-Down" programming techniques, where the programmer defines the sequence in which the program flow will occur and then builds the code accordingly. With OOP, the programmer first fully defines the problem the program must handle. He or she then defines the objects (data) to be manipulated and the class (template) best suited to handle the data structures. Once objects and class have been defined, the programmer must determine what operations (verbs) will be performed on or by the objects.

Object-oriented programming holds a great deal of promise, especially in development situations where each module is created and compiled separately. Although some may welcome its intuitive approach to programming, OOP is not necessarily for everyone. Even many experienced programmers find it too rigid and complex for their own use. The fact remains that for many people, the logic and structure of most programming languages continue to be too complex and uncomfortable. For the average computer user, even these relatively newer approaches seem just as difficult to understand as the techniques used by the mainframe programmers and technicians of a generation or two ago.

Design Your Own Application

All this, however, appears to be changing. Just as the computers themselves are becoming easier to use, so too are the means of creating programs. Just a few years ago, commercial programs began turning up that allowed even nonprogrammers to create customized database software. To create your own application, you merely answered a series of questions that defined the custom application. The code-writing part of the program then did a lot of writing to the disk, which eventually produced a very large program, usually in BASIC, that did more or less what you wanted. While not an entirely satisfactory piece of software, it was something anyone could use.

Today we have several new application-generating languages for the Amiga that are both more sophisticated and simpler to use. A good example is INOVAtronics' **CanDo**, which breaks down program creation into a process involving the generation of small modules, or cards. (Think of the completed application as a deck of cards.) In using this kind of approach, the lay programmer is working with modern programming practices—such as structured or object-oriented programming—without even being aware of it. (For a review of CanDo, and other interactive authoring-system software, see May '90, p. 12.)

Just about anyone who can use a mouse can create a program with CanDo. The majority of program functions use requesters to get information about a task. For example, to create a custom window, you need only click on the window button and then define the size and number of colors you want by clicking on the pop-up Dimension requester. Or, to have the program load a previously created picture, simply select the picture from a file requester.

As you can see, using CanDo's high-level interface makes it extremely simple to create a custom screen and window or load an IFF image. Contrast this kind of ease of use with the time and effort it would take to write the numerous lines of C code required for the same task.

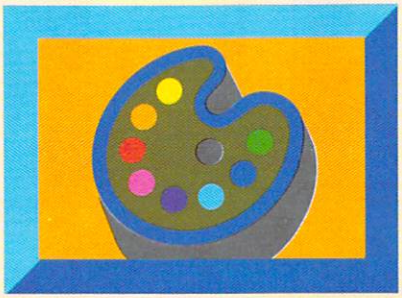
While CanDo is primarily a requester-based system, many of its functions do require you to create a script in order to use them. These scripts are similar to more conventional programs in that they are a set of written instructions executed in a sequential manner. Like BASIC, the commands and functions are very high level, but they are not as intuitive for the nonprogrammer as other aspects of CanDo. For most nonprogrammers, however, learning to use the script functions of CanDo is much easier than trying to learn even a language such as BASIC.

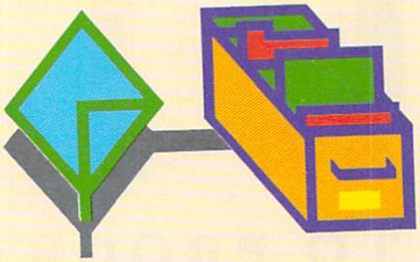
Look, Ma, No Code: The Icon Revolution

While the CanDo interface certainly seems easy and intuitive, how about an entirely graphics-based ap-

ILLUSTRATED BY JACK TOM







COND GOTO **GRAPHIC** **IF THEN ELSE**

proach to programming? That's exactly what Commodore's new **AmigaVision** multimedia-authoring system, announced with the Amiga 3000 in April, offers Amiga users. Working with AmigaVision is unlike programming in any other language on the Amiga. There are no scripts at all; instead, you use graphic icons to issue commands and requesters to input information needed by the program. (For more on AmigaVision, see "Welcome to a New Generation," Jun. '90, p. 18, and stay tuned for an AmigaVision tutorial coming up in a future issue.)

An AmigaVision program looks exactly like a flowchart. You place each command in position on the flowchart by using the mouse to drag the icon from its menu and place it in the desired position inside the flow window. Once you acquaint yourself with the icons, it is possible to understand most of the program by simply looking at the flowchart. (This reminds me of the old programming joke that no comments were needed because the code was "obvious". AmigaVision comes very close to making such wishful thinking a reality.)

Once you position them in the flowchart, you must further define the AmigaVision icon commands. By double clicking on the icon, you bring up a requester with buttons, gadgets, and information fields specific to the icon. Using the mouse, it is very simple to define the requester—although even here some fields still require keyboard entry.

What is striking about AmigaVision's approach is that it combines two of today's most popular programming techniques. In some ways, it reflects the top-down approach of structured programming, because with many AmigaVision applications it is possible to write the program before you actually go in and define the specifics of the icons. For example, a specific action in the program might trigger a picture to be displayed, while another action triggers an animation or sound. You do not actually have to define the animation, sound, or picture while you are creating the overall program flow. These implementation details can be decided on at a later point in the application development.

AmigaVision (and CanDo) can also be considered—at least to some degree—as an object-oriented language. For example, using our admittedly minimal description of objects and classes above, you could think of the icons as class definitions. The Anim requester is the general template for the "class" of "objects" called animations, specifically defining the characteristics required for displaying and playing the animation. Once defined, the requester is an actual animation object whose fields contain information specific to this object and the actions it can take.

One point I want to make about all these new approaches to programming is that they are not, of course, for everyone or for every project. For most (although not all) commercial software development, conventional languages (C, Modula II, assembly) are better choices. Some programmers will categorically reject icon-based languages as gimmicks. Other conventional programmers, however, may find very good reasons to use one of the new multimedia languages over other methods. In addition, ordinary users may discover they can now, finally, write the program they had always wanted to write but could never accomplish using more complex traditional languages.

It may be some time before these user-friendly computer languages attain a level where they are as powerful as current development systems. But who knows, perhaps in the not-too-distant future, we will simply tell the computer what we want it to do and it will write its own program. That might sound like science fiction today, but with computers becoming increasingly more sophisticated and powerful, don't think it can't happen. If you don't believe me, think of all those techno-priests of the previous generation who sniggered into their white lab coats when some farsighted feller hinted at where computers might be in another 25 years, say about 1990! ■

CLUES

TO PROGRAMMING THE AMIGA

Investigate the routines of the system software, and you'll find the solution to getting more out of your BASIC and C programs.

WHILE PROGRAMMING IS tedious and painful to some people (sort of like doing your taxes while having a tooth drilled), the experienced Amiga programmer probably finds it as challenging as unraveling a good mystery game. The casts of programming capers don't include butlers, but you will find plenty of suspects in the libraries, which are the system software's groups of related, ready-made functions that control the Amiga's features.

The main differences between programs—whether C or BASIC—on the Amiga and on other computers are in the sections that receive user input or display output to the screen. The input and output routines in standard BASIC and C have been geared towards a text-based console device. Traditionally, these languages expect all input to come from the keyboard as a stream of text characters, and all output to go to the display screen or printer in the same kind of text stream. They also assume that the computer has nothing else to do but handle your program's input and output (no multitasking).

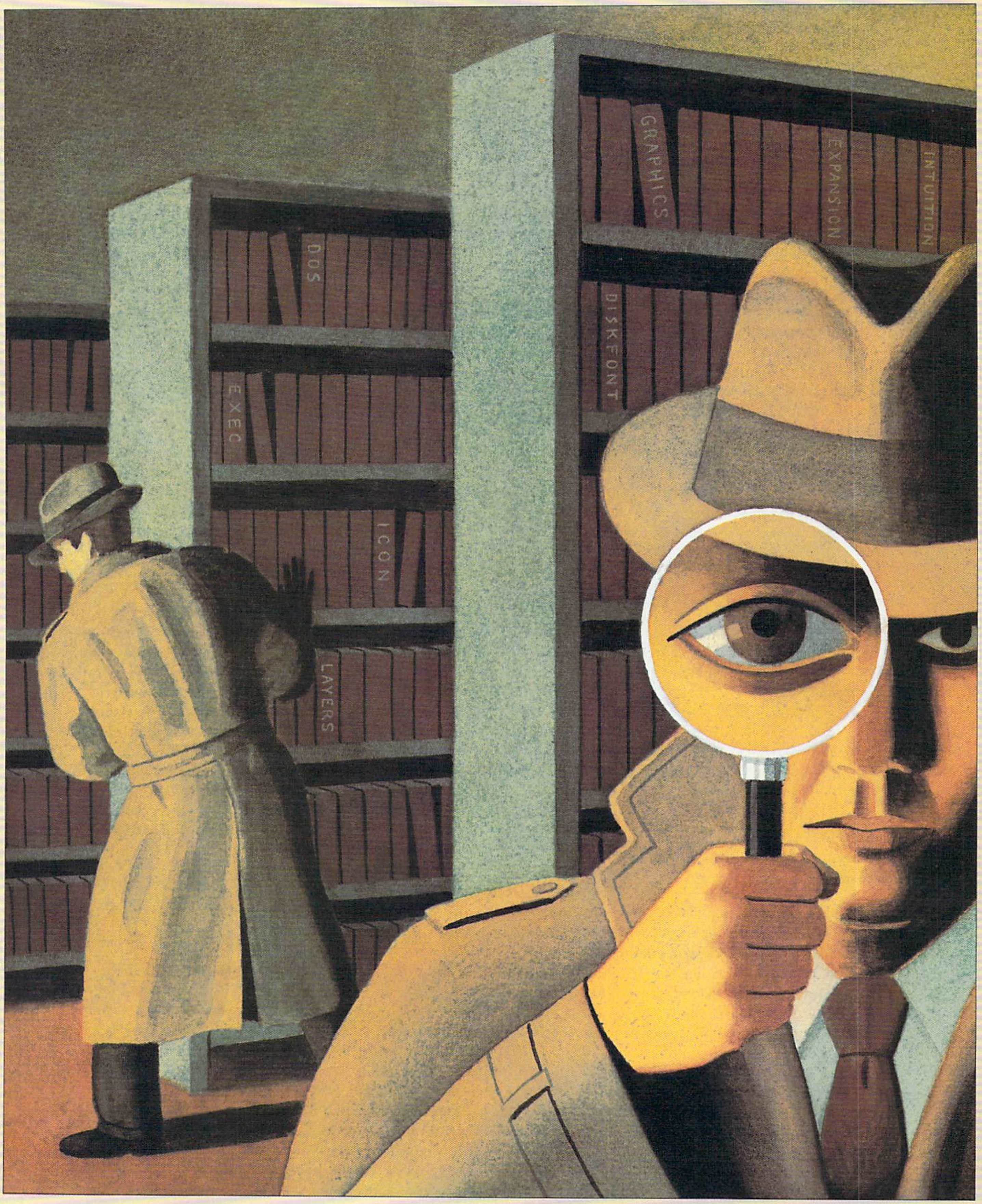
The Amiga, however, can receive input from the keyboard as a stream of text characters or Rawkey codes, or from the mouse in the form of messages from the Intuition user interface about mouse movements, mouse-button events, gadget events, or menu selections. Your program can even receive input from other programs through a public message port. For the most part, output goes to a graphics display that you can set to a number of different display modes. On the Amiga, even text is treated as graphics and can be displayed using a variety of fonts, type styles (such as bold or underline), colors, and drawing modes.

To help you access the machine's system-specific features, the Amiga's operating system provides libraries of fairly high-level support for programmers, and both BASIC and C provide methods for incorporating these functions into your own programs. The most important libraries reside in the Kickstart ROM, while some auxiliary ones are stored on the Workbench disk's libs: directory. For example, functions related to the mouse-driven user interface are in the Intuition library, while low-level graphics routines are located in the Graphics library.

Before you use one of the functions in a library, you first open the library to notify the system that it is in use and to retrieve the location of the library's base memory address for your program's reference. After you are finished with a library, you should close it to tell the system you no longer need it.

Both Amiga Basic and C allow you to include Amiga system functions in your programs, but they do so in different ways. C contains few intrinsic commands and has always used external-function libraries to supply all input and output functions. Amiga C compilers, therefore, let programmers call Amiga system functions exactly as they would call external C func- ►

By Sheldon Leemon



ILLUSTRATED BY JAMES STEINBERG

tions, except for having to open and close the Amiga libraries. BASIC, however, relies on internal commands to provide all of its functions. The BASIC approach to expanding its functionality is to add new commands to the language.

Amiga Basic contains many commands that provide the same general functions as some of the Amiga system routines, but that use the terminology and syntax of BASIC, rather than that of the system routines. In many cases, the BASIC equivalents of the system routines are much easier to use than the original functions, but are also far more limited in their capabilities. Because the system contains so many functions, however, adopting them all would be too unwieldy.

Amiga Basic tries to remedy this with Library and Call functions that allow you to use system functions within your own programs. The major problem with this alternate approach is that Amiga system functions often require large data blocks as input, and the BASIC methods for setting up such data blocks are all somewhat clumsy.

Let's look at a simple example problem programmed in C (Listing 1) and in Amiga Basic (Listing 2). The programs merely display some colored text

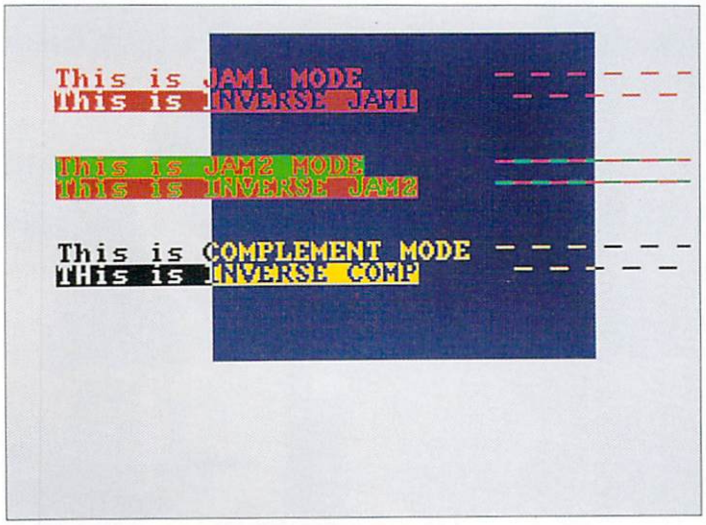


Figure 1. Example of the C program's output.

and dotted lines in each of the Amiga drawing modes on a low-resolution, 8-color screen. Although the two versions are similar in design and function, the BASIC code is much shorter, because some of the BASIC commands take the place of several Amiga system functions. In addition, the C version has to declare variables and define data structures that the BASIC version does not need.

GATHER THE SUSPECTS

The programs are divided into three sections. In the initialization section, we do all the set-up work necessary for displaying graphics. In the C version, this means first opening the Intuition and Graphics libraries with OpenLibrary( ) function calls. The Intuition library contains the screen and window commands needed to prepare the display, while the Graphics library contains the functions that actually draw graphics and text on that display.

Once the Intuition library is open, we can prepare the display with the OpenScreen( ) function. Think of an Intuition screen as a backdrop upon which output windows are opened. The screen defines the display mode for these windows, including the width and height of the screen, horizontal resolution (hi-res or lo-res), vertical resolution (interlaced or not), color depth (2–32 colors), and such incidentals as default colors and text font. Near the top of the program file, the NewScreen data structure (here called NewCustScr) specifies all of these items.

After we open the screen, we can open an output window by using the OpenWindow( ) function. Each output window has many attributes, including the screen to which it is attached, starting size and position on that screen, maximum and minimum sizes, window title, system and custom gadgets, and Intuition events (such as mouse movements and key presses) about which the window should be notified. We define all these parameters in the NewWindow data block, which we call NewWdw (following NewCustScr in the program). Now, we also set the color registers that will be used on this custom screen, using the LoadRGB4( ) command. LoadRGB4( ) lets us load all eight colors at once from a list contained in the colormap array.

The BASIC initialization sequence is similar, but differs on some key points. First, we use the Library command to open only the graphics library. Because the screen and window commands we need are built into BASIC, we need not open the Intuition library. For the Library command to work properly, however, a file called graphics.bmap must be located in the directory from which the BASIC program is run or in the Workbench's libs: directory. To create a graphics.bmap file, you must run the BASIC program ConvertFD (found in the Extras disk's BasicDemos directory). When the program asks you which .fd file to read, type:

```
extras 1.3:fd1.3/graphics_lib.fd
```

and when it asks which .bmap file to write, reply:

```
libs:graphics.bmap
```

The next command is DEFLNG A–Z, which declares that all variables should be treated as 32-bit integers. This is a good practice when dealing with Amiga system functions, because these functions expect input values to be 32 bits long. To open a custom screen, we use Amiga Basic's Screen command, which is similar to the system's OpenScreen( ) function. Instead of requiring a NewScreen structure with 13 input values, however, the Screen command takes just five input values, giving us control over width, height, color, depth, and mode, while using defaults for other values such as the text font. ►



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The Window command that we use to open an output window on this screen is, similarly, a limited version of the OpenWindow( ) function. It allows us to specify the screen to which it is attached, the size and title of the window, and the system gadgets that we want to attach, but does not let us receive event messages concerning these gadgets. As a result, if we were to include a close gadget, the user would be able to close our output window, but the program would never be notified that the window had been closed! The inability of Amiga Basic programs to receive event messages from their windows seriously limits the usefulness of the BASIC version of the Amiga windowing system.

To close out the initialization routine, we set the screen-color registers, using the Palette command. This command is like the SetRGB4( ) system function, which sets one color register at a time, rather than LoadRGB4( ), which sets a number of them at once. As a consequence, we must repeat the Palette command for each register we wish to set. Finally, we set up an array of text strings called Mode$, for the various messages we want to print. This corresponds to the textmsg array in the C program, but because BASIC lacks a means of setting values for a number of data items at once, we must set each string value separately.

Examine the Evidence

The next section of the programs, ShowModes, is the one that performs the real work of drawing the text and graphics. First, it draws a filled blue rectangle on the screen. In the C version, we set the drawing pen to blue with the SetAPen( ) function, and use the RectFill( ) function to draw the filled box. In BASIC, we use a single Line command both to set the drawing color and to draw the filled box.

Next, the programs prepare for writing text and drawing dashed lines in the various drawing modes by setting the foreground and background pen colors to red and green, respectively, and setting the line pattern to long dashes. In C, separate SetAPen( ) and SetBPen( ) calls are needed to set foreground and background colors, but in Amiga Basic a single Color command handles both. To set the line pattern in C, we use the SetDrPt( ) macro (which is defined in the include gfxmacros.h file), while in BASIC we use the Pattern command.

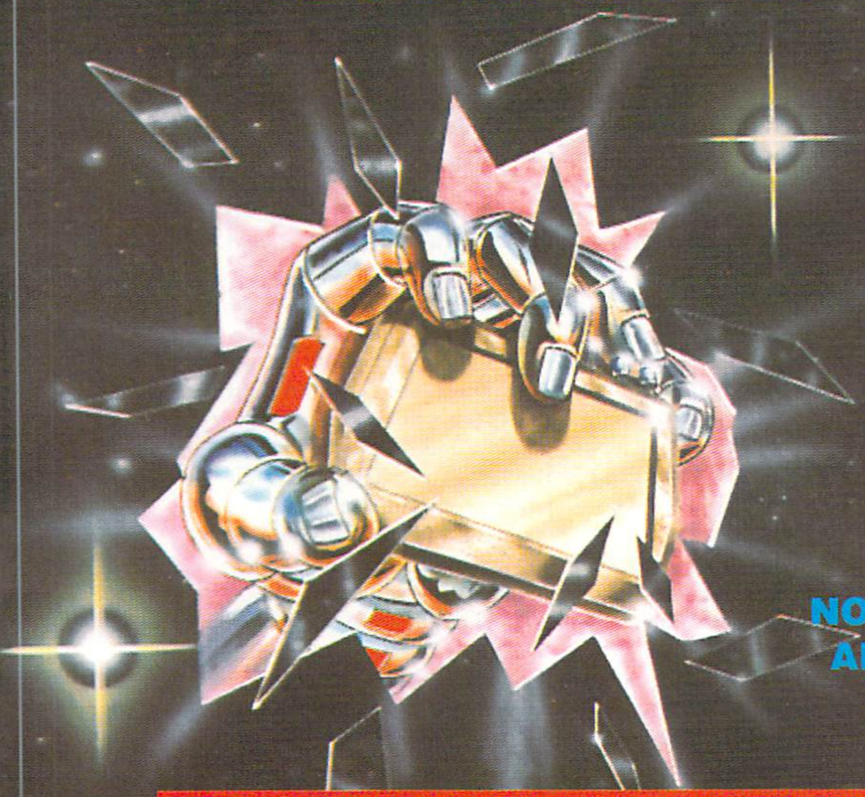
Because the remaining graphics output is repetitive, it's drawn within a loop, a repeating block of program code. In both cases, nested FOR loops do the trick; for each of three blocks of text, the programs print two lines in each block. First, we calculate the vertical, or y, position; then we calculate a drawing mode. The actions are similar in both programs, although in the BASIC version, the y position is expressed as text lines, while in C, the position is figured in screen dots, or pixels. (In this case, each text line is eight pixels high.)

Next, we set the drawing mode, print a line of text, and draw a dotted line. Because BASIC lacks a function for setting the drawing mode, the BASIC pro- ►

Amiga-specific BASIC Keywords and Corresponding C Functions

Amiga Basic	C Function	Amiga Basic	C Function
SCREEN	OpenScreen( )	OBJECT functions	Vsprite calls such as AddVSprite( ), DrawGList( ), RemVSprite( )
SCREEN CLOSE:	CloseScreen( )		Bob functions like AddBob( ), RemBob( ), RemIBob, SortGList( )
WINDOW	OpenWindow( )		
WINDOW CLOSE	CloseWindow( )	ON COLLISION	DoCollision( )
		COLLISION ON	SetCollision( )
AREA	AreaDraw( )	PUT, GET (screen)	ClipBlit( ), BltPattern( ), DrawImage( )
AREAFILL	AreaEnd( )		
CIRCLE	DrawEllipse( ), AreaEllipse( )		
CLS	SetRast( )	LIBRARY	OpenLibrary( )
COLOR	SetAPen( ), SetBPen	LIBRARY CLOSE	CloseLibrary( )
LOCATE, PTAB	Move( )		
PSET, PRESET	WritePixel( )	TRANSLATE$	Translate( )
POINT	ReadPixel( )	SAY	OpenDevice( ) and SendIO( ) on narrator.device
LINE	Draw( ), PolyLine( ), RectFill( )		
PAINT	Fill( )	SOUND	OpenDevice and DoIO with audio.device
PALETTE	SetRGB4( )		
PATTERN	SetDrPt( ), SetAfPt( )		
SCROLL	ScrollRaster( )	BEEP	DisplayBeep( )

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gram must call the SetDrMd( ) function directly, just as the C version does. For input, this call requires the mode number and a pointer to the window's RastPort data block. In BASIC, the Window(7) function returns the RastPort address. The mode number specifies a drawing mode such as JAM1, JAM2, or Complement.

In JAM1 mode, the program uses the foreground color to draw the text. In JAM2, the text is drawn in the foreground color, and the background to the text is drawn in the background color. In Complement mode, the text is drawn in the color whose pen number is the complement of that of the existing background color. (If this is hard to visualize, study Figure 1, showing the C program's output.)

With the drawing mode set, the program now writes the text and draws the dotted line. In C, this requires a Move( ) call to set the pen position, a Text( ) call to print the text, another Move( ) call, and a Draw( ) call to draw the line. In BASIC, we need only Locate, Print, and Line statements, because the Line statement combines both move and draw operations.

PRONOUNCE THE VERDICT

After drawing the display, the program needs to get a signal from the user to end. In BASIC, the Sleep function suspends the program until the user presses a key or mouse button. Sleep does not give us any information about the event that ended it, though. It also seems susceptible to prior events, which is why we use two Sleep commands in a row. The first one is terminated by events that have been stored up, while the second one does the actual waiting.

In the C program, we use the WaitPort( ) function to suspend the program until we get an Intuition message. Because we specified when we opened our window that it would like to get both Rawkey and Mousebutton messages, either event will satisfy the WaitPort( ) function. This example uses the WaitPort( ) function in a fairly crude manner, as it does not check to see what kind of message it received. Unlike the BASIC version, however, the C program can interpret the message it gets and use the information about mouse movement or key strokes for a productive purpose. When the programs get the signal to end, both versions close the output window, the custom screen and the libraries they opened, and then exit.

As you can see, adding Amiga-style input and output to your BASIC and C programs is relatively simple. Keep in mind, however, that while Amiga Basic's built-in Amiga functions make getting started easy, they are not ultimately powerful enough for the most sophisticated kinds of applications. For those, you will need to call the Amiga system routines directly, just as you do when programming in C.

The best source for further information about these routines is the *Amiga ROM Kernel Reference Manual: Libraries and Devices* ($33.95, Addison-Wesley, Route 128, Reading, MA 01867, 617/944-3700). Once you have learned how to send output to windows, and to receive input from menus, gadgets, mouse and keyboard, you'll be well on your way to becoming a master detective, writing programs with a distinctive Amiga flair. □

Sheldon Leemon is the author of Inside Amiga Graphics *and co-author of the* AmigaDOS Reference Guide. *Write to him c/o* AmigaWorld *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

Listing 1. Demo program written in C.

```
/* Drawmode.c: shows lines and text in the both
 * DrawModes with Inverse and Complement modifiers */

/* Include the definitions we need */
#include <exec/types.h>
/* includes type defintions like USHORT */
#include <intuition/intuition.h>
/* includes data definitions like NewWindow */
#include <graphics/gfxmacros.h>
/* includes definition of SetDrPt macro */

/* Structures needed for libraries */
struct IntuitionBase *IntuitionBase;
struct GfxBase *GfxBase;

/* Structures required for graphics */
struct Screen *CustScr;
struct Window *Wdw;
struct ViewPort *WVP;

/* function prototypes */
VOID main(VOID);
VOID initialize(VOID);
VOID showModes(VOID);
VOID cleanExit(int);

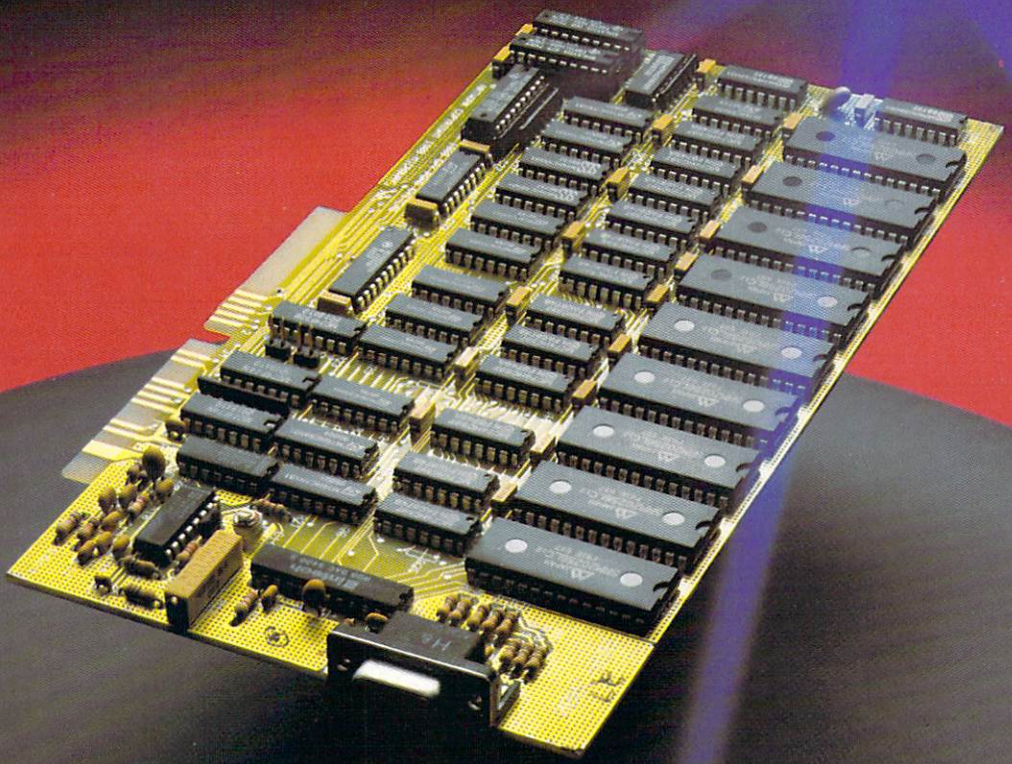
/* Program Constants */
#define Rp   Wdw->RPort        /* for brevity */

#define WHITE     0xFFF
#define RED       0xF00
#define GREEN     0x0F0
#define BLUE      0x00F
#define CYAN      0x0FF
#define PURPLE    0xF0F
#define YELLOW    0xFF0
#define BLACK     0x000

/* Color Map Data */
   static USHORT colormap [8] =
      {
      WHITE,RED,GREEN,BLUE,YELLOW,CYAN,PURPLE,BLACK};

/* Pre-initialized Text Structure */
struct TextAttr StdFont =
   {
   "topaz.font",              /* Font Name */
   TOPAZ_EIGHTY,              /* Font Height */
   FS_NORMAL,                 /* Style */
   FPF_ROMFONT,               /* Preferences */
   };
```

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flickerFixer fits into the Amiga video slot or the Microway Denise Extender, is fully compatible with all software, and does not modify the standard Amiga video signals. For more information, call Microway Sales at (508) 746-7341 or your Amiga Dealer.

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```c
/* Preinitialized NewScreen & NewWindow Structures */
   struct NewScreen NewCustScr =
      {
      0,0,           /* LeftEdge (always=0),TopEdge */
      320,200,3,     /* Width, Height, Depth */
      0,1,           /* DetailPen and BlockPen */
      SPRITES,       /* special display modes */
      CUSTOMSCREEN,  /* Screen Type */
      &StdFont,      /* Pointer to Custom font*/
      NULL,          /* Pointer to title text */
      NULL,          /* Pointer to Screen Gadgets */
      NULL,          /* Pointer to CustomBitMap */
      };


struct NewWindow NewWdw =
   {
   0,0,             /* Left Edge, Top Edge */
   320,200,         /* Width, Height */
   0,1,             /* Block Pen, Detail Pen */
   MOUSEBUTTONS |
   RAWKEY ,
   /* set IDCMP flags to for mouse & key events */
   SMART_REFRESH |
   ACTIVATE |
   GIMMEZEROZERO,   /* Window Flags */
   NULL,            /* Pointer to First Gadget */
   NULL,            /* Pointer to Check Mark image */
   NULL,            /* Window Title */
   NULL,            /* Pointer to Screen structure */
   NULL,            /* Pointer to custom Bit Map */
   0,0,             /* Minimum Width, Height */
   0,0,             /* Maximum Width, Height */
   CUSTOMSCREEN     /* Type of Screen it resides on */
   };


/* ***** Program Begins Here ***** */
VOID main()
{

initialize();
/* open libraries, screen, window and set colors */
showModes();      /* draw text and dashed lines */

WaitPort(Wdw->UserPort);
/* wait for a mouse button or key press */

cleanExit(0);
/* close window, screen, libraries, and exit */
}

/* **** Initialization function: Open the Intuition
* and Graphics libraries, open the custom screen and
* window, Set color registers for screen ***** */

VOID initialize()

{
/* Open the Intuition and Graphics libraries.
* If 0 is returned, libraries aren't available. */
 IntuitionBase = (struct IntuitionBase *)
   OpenLibrary("intuition.library", LIBRARY_VERSION);
 if (IntuitionBase == NULL) cleanExit(100);

 GfxBase = (struct GfxBase *)
   OpenLibrary("graphics.library", LIBRARY_VERSION);
 if (GfxBase == NULL) cleanExit(200);

/* Open the Screen and Windows.  If 0 is returned,
* they weren't opened. */
 if ((NewWdw.Screen = CustScr =
   (struct Screen *)OpenScreen(&NewCustScr)) == NULL)
   cleanExit(300);

 if ((Wdw = (struct Window *)OpenWindow(&NewWdw)) ==
   NULL) cleanExit(400);

/* find the viewport and load color registers */
WVP = (struct ViewPort *)ViewPortAddress(Wdw);
LoadRGB4(WVP,&colormap,8);     /*load new colors */
}

/* ***** Show drawing modes: Print text and draw
* dotted lines in each of the drawing modes ***** */

VOID showModes()
{

int block,row, y, mode;

static char *textmsg[]={
    "This is JAM1 MODE",
    "This is INVERSE JAM1",
    "This is JAM2 MODE",
    "This is INVERSE JAM2",
    "This is COMPLEMENT MODE",
    "THis is INVERSE COMP"};

SetAPen (Rp,3);
RectFill(Rp,92,13,262,133);
SetDrPt (Rp,0xFF00);
SetAPen (Rp,1);
SetBPen (Rp,2);

for(block=0;block<3;block++)
    {
    for(row=0;row<2;row++)
        {
        y=(((block+1)*4)+row)*8;
        mode = block + (4*row);
        Move(Rp,24,y);
        SetDrMd (Rp,mode);
```

Listing 2. The same demo programmed in Amiga Basic.

```basic
GOSUB Initialize:     'Open libraries & set up screen

showModes:
LINE (92,13)- STEP (170,120),3,bf
'draw blue box for contrast
PATTERN &HFF00        'striped pattern
COLOR 1,2                'set colors to red and green

FOR Block = 0 TO 2         'for 3 blocks
  FOR Row = 0 TO 1         'with 2 lines in each block
    y=((Block + 1) * 4)+Row
    LOCATE y,4             'Position for PRINT
```

```
    Mode = Block + (4 * Row)
    CALL SetDrMd& (WINDOW(8),Mode)  'Set drawing mode
    PRINT "This is ";Mode$(2*Block + Row)
    'Print text in this mode
    LINE (219,y*8-4)- STEP (85,0)
    'Draw line in this mode
  NEXT Row
NEXT Block

SLEEP:SLEEP   'Wait for mouse click or key press


cleanExit:
WINDOW CLOSE 2              'Close Window
SCREEN CLOSE 1              'Close Screen
LIBRARY CLOSE               'Close Libraries
END


Initialize:
LIBRARY "graphics.library"  'Open graphics library

DEFLNG A-Z                  'use long integers

SCREEN 1,320,200,3,1  '320X200 los-res, 8 color
screen
WINDOW 2,,,0,1        'Full-screen window, no gadgets

PALETTE 0,1,1,1  'White background
PALETTE 1,1,0,0  'red--used for foreground pen
PALETTE 2,0,1,0  'green--used for background pen
PALETTE 3,0,0,1  'blue
PALETTE 4,1,1,0  'yellow--complement of blue
PALETTE 7,0,0,0  'black--complement of white

Mode$(0)="JAM1 MODE"
Mode$(1)="INVERSE JAM1"
Mode$(2)="JAM2 MODE"
Mode$(3)="INVERSE JAM2"
Mode$(4)="COMPLEMENT MODE"
Mode$(5)="INVERSE COMP"

RETURN
```

```
        Text(Rp, textmsg[2*block+row],
              strlen(textmsg[2*block+row]));
        Move(Rp,219,y-4);
        Draw(Rp,304,y-4);
        }
    }
}

/* ***** Exit after cleaning up: Close the custom
 * screen, window, and libraries in the reverse order
 * from which they were opened. ***** */

VOID cleanExit(returnValue)
int returnValue;
{
   if (Wdw) CloseWindow(Wdw);
   if (CustScr) CloseScreen(CustScr);
   if (GfxBase) CloseLibrary(GfxBase);
   if (IntuitionBase) CloseLibrary(IntuitionBase);
   exit (returnValue);
}
```

■

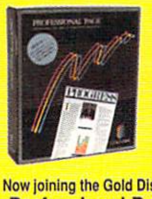
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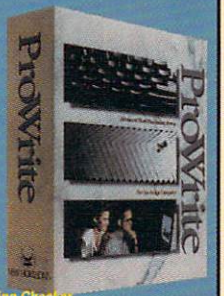
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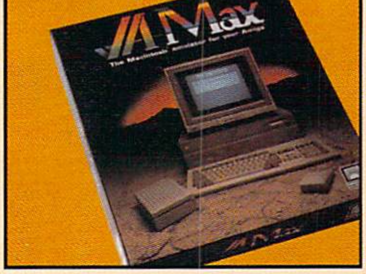
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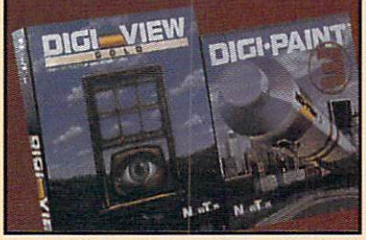
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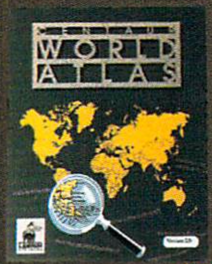
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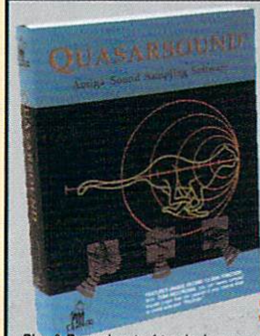
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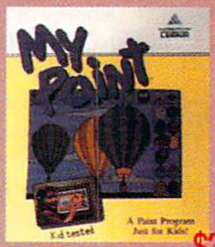
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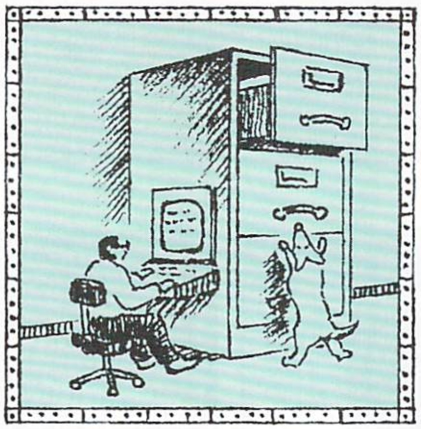
Hard Lessons: Solid Results

Careful organization and maintenance of your hard-disk drive can pay big dividends. Here are five tips—with appropriate support utilities—to help you make the most of your investment.

By Mike Hubbartt

WITH THE PRICE of Amiga hard-disk drives dropping steadily, more and more users can afford the luxury of owning one. The problems involved with organizing and maintaining your hard drive, however, still remain—no matter what kind of bargain you drive in obtaining one. Here's a five-point "crash course," if you will, in procedures to follow and software tools to use for installing programs, protecting data, and improving overall performance when adding a hard drive to your system.

1 Get Organized!



Organizing your hard-drive directories efficiently will save you an enormous amount of time and confusion. Keep similar programs grouped together in separate drawers (directories) so the root (main hard-drive) directory is not cluttered with too many files. Because the root directory is normally in the search path, you will waste a great deal of time if your program is looking for a file and first has to search through, say, 300 root-directory files. You can also get to an individual program much faster if you avoid such jam-ups in the root directory.

In addition, you won't have to spend a lot of time backing up files if you organize well. For instance, I keep data for my word processor, database, and C compiler in separate subdirectories in their respective drawers, enabling me to make a backup of just those files on a daily basis. This avoids the time-consuming process of constantly making a complete backup of the hard drive, as I already have a master backup! Although some people may favor doing a complete daily backup, I would rather spend my time working on the system rather than waiting for a backup to finish.

As a working example, I have organized my 20MB hard drive, The Vault from Progressive Peripherals, as follows: I have two word processors, WordPerfect (plus WordPerfect Library) and Transcript, in a drawer labeled "Write." My database, Professional Data Retrieve, is in a drawer called "PDR." Grouped in a drawer named "Science" are a number of related science programs consisting of Distant Suns, MathAMation, Doug's Math Aquarium, and Elements (a shareware program displaying the elemental periodic chart). A "Utilities" drawer holds telecommunications software, along with DiskMaster and Disk Mechanic. The "Aztec" drawer contains my Aztec 5.0 C Compiler, while "CanDo" holds the multimedia-authoring system of the same name. As you can see, the choice of where to place programs is up to the user—but the principle of efficient organization remains the same. Because some of these programs are stored together in a single drawer, it is necessary to make extra drawers to hold these files. The easiest method is to single click on an empty drawer, select Duplicate and then Rename from the Workbench menu, and type in the drawer's new name.

DiskMaster ($49.95, Progressive Peripherals), contained in my Utilities drawer, comes in very handy when you are working with a hard drive. The program handles bulk file management—which can become confusing when you are dealing with a lot of deeply embedded subdirectories. Because of its simple point-and-click interface, DiskMaster lets you ►

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Introducing the art of memory engineering. With the Amiga's practically unlimited potential, often the only barrier to greater productivity is a lack of memory. Adding expansion memory to your computer opens doors to new capabilities. But knowing how much to add and how to add it can be a real headache.

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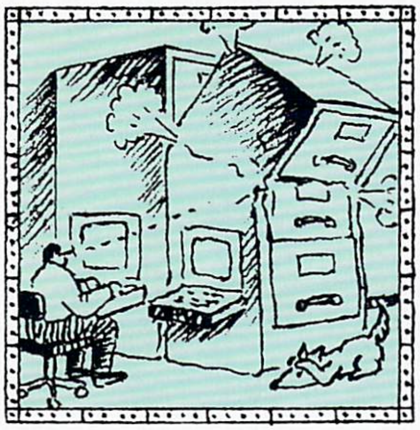
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move easily around directories and subdirectories to choose files for deleting, copying, moving, and renaming. The program also makes it quite simple to create new directories and subdirectories when you are working on complex projects—again without the bother of having to enter the CLI or Shell.

Back 2 It Up!



Although complete backups of your hard drive on a daily basis may be superfluous if you have your directories organized properly, the importance of the right kind of backing-up procedures cannot be overemphasized. I learned the hard lesson of having a current backup of software on my hard drive when it crashed for the first time. If you haven't experienced a crash before, take it from me—it is definitely bad news! A hard drive has one or more platters that spin at a high rate, and the drive heads float above these platters while reading the information from them. A head crash occurs when the drive heads actually touch the rotating disks, physically damaging them and corrupting any data stored at the point of contact. A head crash can occur if the hard drive

- is jolted or dropped during operation;
- loses power and a stepper motor is used in the drive;
- experiences controller failure.

Because programs and data occupy more than a single sector, a bad sector may have more of a disastrous effect than you might think—especially in a database or spreadsheet, where every bit of data is critical. Also, if a program has code stored on a bad sector, the program might not load at all, may give erroneous results in calculations, or might even crash your system. Not an entertaining prospect, to be sure.

Back-up Programs Back-to-Back

There are a number of trustworthy back-up programs available, both commercially and in the public domain. Two that I use are **Double Back**—on the previously mentioned **Disk Mechanic** ($89.95, Lake Forrest Logic)—and **Superback** ($79.95, The Disc Company). Both work with easy point-and-click interfaces, and each lets you back up the complete hard drive or only those files that have changed since the last backup. Double Back, however, allows you to use more than one disk drive, while Superback sends files only to df0:. Both programs automatically format the disks holding the backed-up files.

The recently updated **Quarterback** ($69.95, Central Coast) also provides good back-up protection. Version 4.0 ($10 upgrade price to current Quarterback owners) adds a number of new features, including a Print Catalog for creating archive reports after backups, a new "Slow" back-up mode for Amigas that can't handle fast backups, and several enhancements to the archive/restoration report function.

It should be pointed out that neither Superback nor Double Back compresses the hard-drive data to save disk space. A complete backup of my 20MB hard drive (which is almost full—with only 700,000K free) requires some 24 disks. Double Back does back up floppy disks, while Superback does not. Of the two programs, I prefer Double Back, primarily because of the added benefit of getting other useful Disk Mechanic programs all for the same price.

In any event, whichever utility you use, it is crucial to have a reliable backup of your software, because if you do have a crash, you will need to reformat your hard drive and reinstall your software. After my first head crash, it took five hours to reinstall all my software, plus a couple of days to test all the programs and to make the correct additions to my startup-sequence. If you choose to make do without a backup, save the s:startup-sequence (an ASCII file) to a floppy disk; this will save you a lot of time figuring out assignments and paths your programs may require if you need to reinstall your software after a crash.

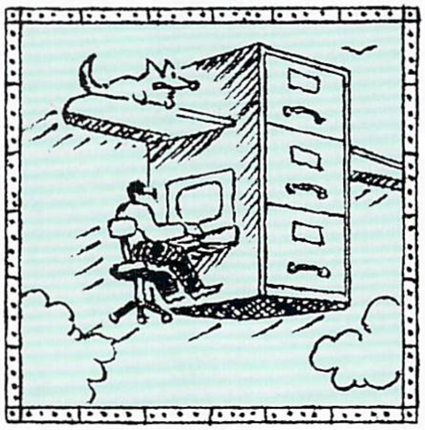
How often should you back up your hard drive? I have two complete backups. Some may question, Why two backups—isn't that a waste of disks? My first backup has all the programs I install on the hard drive initially, while the second is employed after I run an optimizer on the hard drive to enhance its performance (see section 3 below). If the hard drive goes down while you are working on it with the optimizer (which can happen if you run out of memory during optimization or if a power outage occurs), you can reinstall the original backup and try again. *Never* work on a hard drive with software tools without a current backup of the installed software.

After you back up the complete hard drive, your back-up procedures for data generated in your programs should be much easier. As I keep separate subdirectories for data, a weekly backup of those subdirectories suffices. Why? The main software installed on the hard drive rarely changes (except when ►

programs are updated), so a complete system backup is needed only every six months or so. Because my program data does change regularly, I back it up on a weekly basis, or even daily in the case of critical data. While backing up a 20MB hard drive takes almost an hour, backing up only a few files takes minutes—obviously the best way to go unless you have a lot of time to kill.

Optimize = Faster Access! 3

Although good hard-drive organization alone speeds up access to programs and their data considerably, there are other tricks to make program loading even faster and more efficient. One of these is the process called "optimizing." Both floppy- and hard-disk drives store a given program or collection of data in sectors on the disk or platter; but information that belongs together is not necessarily *stored* together, which means that the drive head may have to spend considerable time searching over widely scattered sectors for the information before reading it into memory. This search time adds up when a large program's information is dispersed all over a disk. The optimization procedure relocates each program and its data to contiguous sectors of the disk or platter, thus decreasing the drive head's movement. The disk optimizers I recommend are **B.A.D.** ($49.95, Centaur) and Disk Mechanic's **Tune Up** ($89.95).

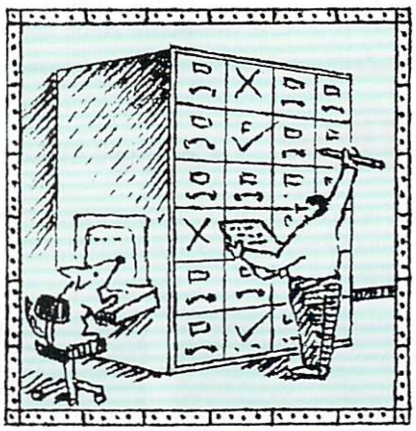


Both B.A.D. and Tune Up do make a difference in performance, making program loading two to five times faster in many cases. (Large programs, such as WordPerfect and Distant Suns, benefit greatly from optimization—more so than such smaller programs as Transcript.) Both Tune Up and B.A.D. can use a Workbench interface (by which you select the drive to optimize and then start the process by clicking on a gadget) or, if you wish, can employ the CLI (where you specify the drive to optimize in the command line). Either B.A.D. or Tune Up could easily become indispensible to hard-drive owners, although I prefer the latter simply because of the other useful Disk Mechanic utilities (such as Double Back) included in the one package.

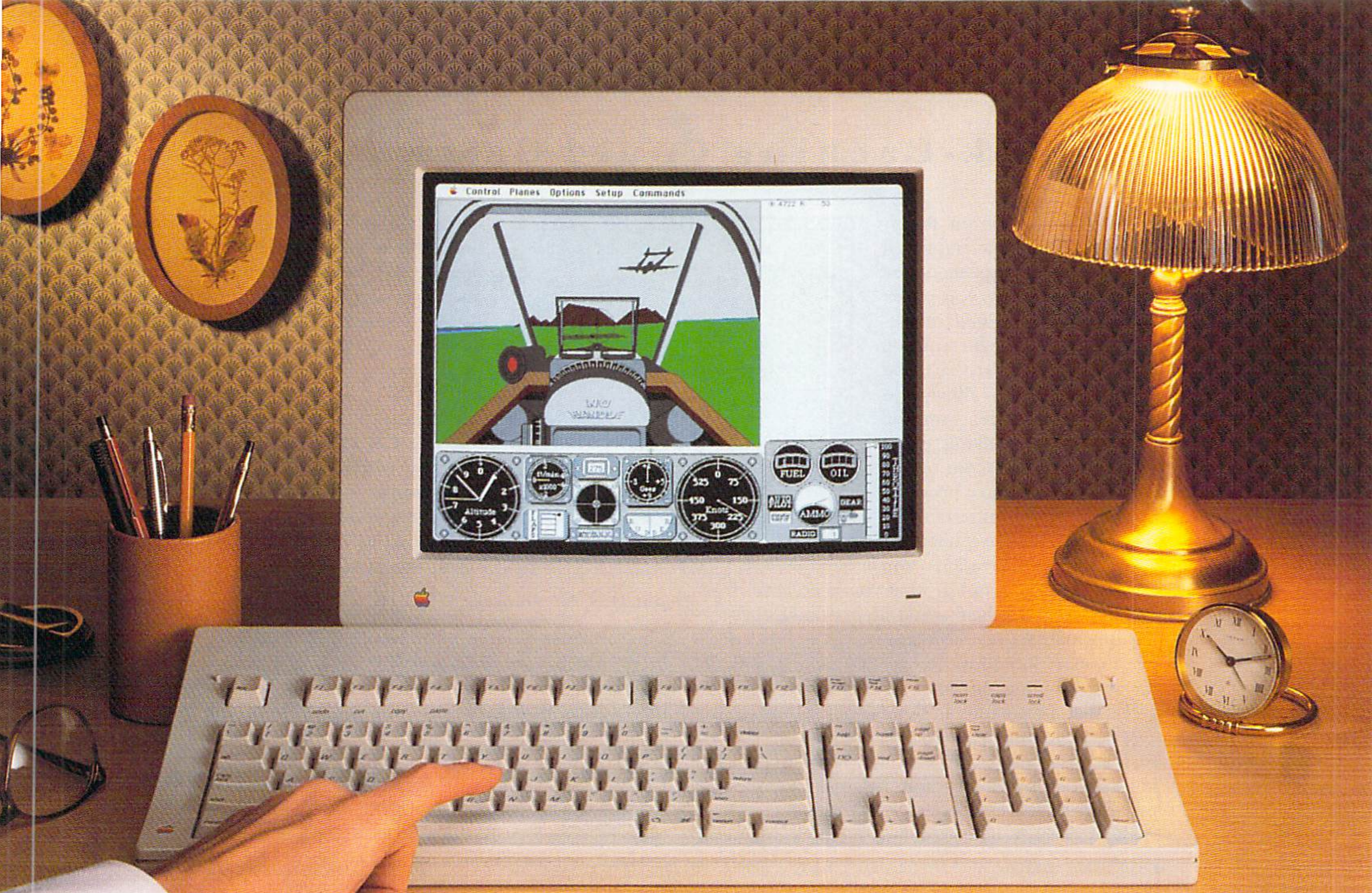
In either case, be prepared to spend some time optimizing your hard drive. It takes over four hours to complete the job on a 20MB drive the first time through—but only a little over an hour for subsequent procedures. It does, of course, take much longer with larger drives, which makes it even more compelling to optimize on a regular basis. Neither program allows selection of only one physical area of the drive for optimization, although Tune Up's gadgets do let you process the complete directory tree or individual directories of the hard drive.

To Err Is Human, To Verify Is Divine! 4

Despite all the careful organization, back-up procedures, and optimization, there are still pitfalls awaiting the hard-drive user. Locating disk errors can be a tricky process. Three programs that can help you here are **Dunlap Utilities'** ($79.95, Progressive Peripherals) Verifydisk program, Disk Mechanic's **Markbad**, and the **Doctor Ami** ($49.95, Free Spirit) program, **Drive Doctor**. All of these programs will find errors on either floppies or a hard drive, even mapping the bad sectors out of the hard-drive availability list so that no programs are stored in these bad sectors.



Any hard drive can pick up errors over time, and these programs will save you the trouble of reformatting (at low or high level) your drive when you get too many program errors for effective operation. A low-level format wipes out all program information on the hard disk, and it takes more time than a high-level format (which is executed with the AmigaDOS Format command). A program that can find and remove bad sectors is a real time-saver. ►



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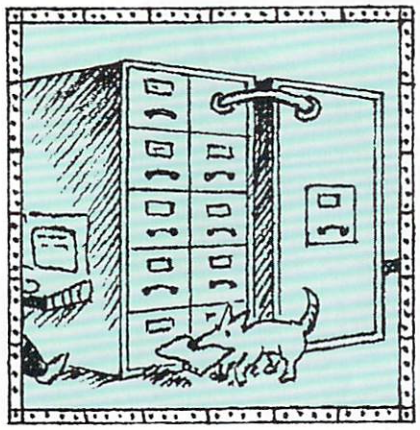
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Disk-Caching Could Catch On! 5

When you move from floppy drives to a hard drive, improved program-loading speed is one of the major benefits you expect from your additional investment. After you begin working awhile with your hard drive, *and* filling it up (not as difficult as you might imagine), you will probably start thinking about expansion—more room on the hard drive and faster program access. A disk optimizer does speed up a hard drive, but there are other considerations and other ways to accomplish what you need here. Disk-caching programs help speed up operations by storing information previously accessed from a disk drive into memory locations that you designate specifically for such holding purposes. By doing so, you can access that information in significantly faster fashion.



Most large Amiga programs are made up of many smaller programs called overlays, which are loaded in as needed by the program. A good example of a program that uses overlays is WordPerfect, whose spelling checker is loaded into memory whenever needed and then removed when no longer required, freeing up memory for other system uses. Such overlays can be stored in RAM, making the information quickly available without the need to access either a floppy or hard drive.

For disk-caching software, I use the **BlitzDisk** program packaged with **TxEd+** ($79.95, MicroSmiths), which works with both floppy and hard drives. I have BlitzDisk installed in my startup-sequence as:

BlitzDisk 250 alf.device NOCHIP

This provides a value of 250 buffers for the hard drive, which uses approximately 125K of memory for caching information accessed previously from the hard drive. BlitzDisk lets you specify both the amount—such as 250 buffers for the hard drive—and the type of caching for each drive—such as NOCHIP. (Choose NOCHIP if the cache RAM should only be Fast Memory, or use DIRONLY if you want only the directory information stored in the cache.)

Although the Amiga market lacks a product with all the tools of The Norton Utilities in the IBM world, there are products out there that should satisfy many of the needs of the Amiga hard-drive user. Unless some Amiga developer comes up with a nearly perfect, all-in-one solution, most users will probably wind up working with several of these utility packages at the same time. And until such time as the ideal, it's-a-snap-to-use utility comes along, the importance of good hard-disk organization and maintenance habits will remain a top priority. ■

Mike Hubbartt is an avid Amiga user and writer who specializes in productivity software utilities and hardware. Write to him c/o AmigaWorld *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

Manufacturers' Addresses

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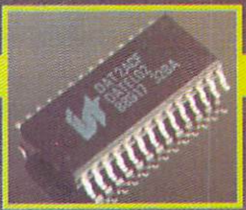
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Tired of overstuffed disks? These file-compression programs will help you free up valuable storage space.



For whatever reason (to conserve storage space, to upload to on-line services faster and save money, or to decompress downloaded files), you *have* made the decision to use a file-archiving program. Okay, but what do you do next? Your brother swears by ARC, his old standby, but the local BBS operator claims that other, newer contenders have long ago surpassed it. Which program should you use: ARC, ZOO, LHARC, or PKAZIP? Does one stand above the rest, or are you better off using a combination of compressors? If so, which should you use when?

Four years ago, the decision was much easier; your only choice was ARC (available on Fred Fish disk #70 or as file #5666 in PeopleLink's AmigaZone), which for the first time let Amiga owners combine and compact one or many files into an archive. The summer of 1987 brought the first challengers: ZOO (Fred Fish disk #164, AmigaZone file #12241) and PAK (AmigaZone file #8896).

ZOO improves on ARC in having the ability to archive files hidden inside a directory and in providing better file compression (or so everyone thought at first—see below for more on ZOO archive sizes), while PAK creates archives you can unravel by simply running them from the CLI as you would with normally executable programs. ZOO gained considerable acceptance (with ARC not far behind) until the giants of the MS-DOS archiving world, LHARC (AmigaZone file #19961) and PKZIP (PKAZIP on the Amiga; AmigaZone file #19805), carried their feud over into the Amiga realm.

The Proof Is in the Packing

To help you sort out the choices, I tracked the big four's compression and decompression times and the sizes of their archives for six sets of files in RAM. For the ARC tests, I also recorded decompression times for PKWARE's PKAX (AmigaZone file #13087), an unraveling utility for .arc files. I ran the tests twice—first on a stock Amiga 2000, then on an A2000 with Commodore's A2630 card (with both the FASTROM and CACHE options enabled via SetCPU).

The six file sets represent an average cross section of data: Communicator version 1.34 is a popular public-domain terminal program; Moria version 3.0 is a PD fantasy role-playing game; ►

By Graham Kinsey

ILLUSTRATED BY WARREN GEBERT

Compression Speed and Size Comparison

	ARC 0.23/PKAX 1.0	ZOO 2.0	LHARC 1.1	PKAZIP 1.01
Compressed file format:	.arc	.zoo	.lzh	.zip
Communicator v1.34 (original size 86859)				
Compressed Size	52363	47702	38241	37791
Compress				
68000	1:06	:20	1:49	:56
68030	:14	:04	:20	:17
Decompress				
68000	:37/:12	:09	:36	:13
68030	:08/:03	:02	:07	:03
Moria v3.0 (original size 756300)				
Compressed Size	N/A	502071	404262	418547
Compress				
68000	N/A	2:59	15:56	11:54
68030	N/A	:37	2:54	1:47
Decompress				
68000	N/A	1:07	5:20	1:40
68030	N/A	:14	1:00	:17
TFL June '89 (original size 295879)				
Compressed Size	N/A	143322	116928	114733
Compress				
68000	N/A	:54	5:35	2:17
68030	N/A	:10	1:01	:30
Decompress				
68000	N/A	:24	1:34	:32
68030	N/A	:05	:20	:07
Woodland II (original size 111814)				
Compressed Size	103478	135584	102433	110371
Compress				
68000	2:43	:49	2:15	1:20
68030	:33	:09	:27	:11
Decompress				
68000	1:07/:11	:04	1:27	:20
68030	:13/:03	:02	:15	:05
Twilight (original size 841662)				
Compressed Size	618601	616941	501076	525191
Compress				
68000	15:26	3:25	13:20	7:03
68030	3:11	:38	2:42	2:29
Decompress				
68000	7:02/1:12	1:05	6:00	1:41
68030	3:44/:12	:12	1:07	:44
Sonix-Progressive (original size 693887)				
Compressed Size	N/A	483861	370068	395513
Compress				
68000	N/A	5:25	15:15	7:01
68030	N/A	1:02	2:53	2:25
Decompress				
68000	N/A	2:57	6:44	3:25
68030	N/A	:38	1:19	1:12

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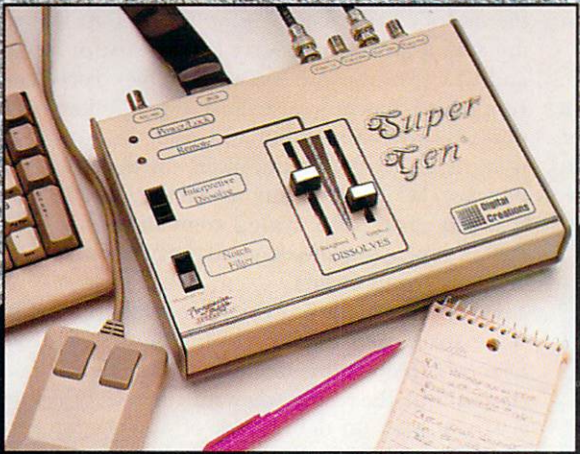
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TFL is the June '89 edition of Chet Solace's Amiga BBS listing called The Final List; Woodland II, from Louis Markoya, is a ray-traced, interlaced, HAM IFF graphic; Twilight is a Jim Robinson VideoScape 3D animation in Anim format; and Sonix-Progressive is Tony Solomon's 90-minute Sonix music collection.

Consult the accompanying chart for a comparison of the performance figures. File sizes are listed in bytes, and times are stated in min:sec format. ARC tests marked N/A could not be completed, as the majority of files in the set had names that were longer than the 12-character MS-DOS standard to which ARC conforms.

A quick look at the numbers shows that, contrary to popular belief, LHARC does not always create the smallest archives. PKAZIP bested LHARC on Communicator and TFL. LHARC, however, usually wins on file sets containing graphics data (such as IFF files), beating PKAZIP by three to eight percent in these tests. PKAZIP's MS-DOS heritage handicaps the program on file sets with graphics, because the PKZIP family is tailored for the most common types of MS-DOS data files—text and executable programs. PKAZIP also did not compress the Sonix-Progressive files as well as LHARC, because the set contains over 150 files (half of which are smaller than 1K), and PKAZIP needs to add more header information (used for identification at decompression) to each file than does LHARC.

On the other hand, PKAZIP creates archives twice as fast as LHARC, and it unravels them three times as fast. Tests did not uphold the myth that LHARC performs *much* better relative to PKAZIP on an accelerated Amiga. The results here were inconclusive: While LHARC improved considerably on the 68030 Amiga, closely approaching PKAZIP's speed for the Twilight and Sonix-Progressive files, it fell further behind in comparison to PKAZIP on the Moria archive.

ZOO, of course, can create and unravel an archive more quickly than any other program. ZOO's archive sizes, however, were usually 20 to 30 percent larger than those of LHARC. ZOO's terrible reputation in connection with IFF pictures also showed up in the tests: ZOO created an archive 30 percent *larger* than the original Woodland II file!

Public-Domain Software Resources

PeopleLink
800/524-0100 (voice)
800/826-8855 (modem)

Fred Fish
1346 W. 10th Place
Tempe, AZ 85281

The biggest loser was ARC, which came in dead last on most of the tests. While it did compress the Woodland II picture almost as well as LHARC, it took slightly longer to do so.

A Tight Decision

For compressing files, ARC and ZOO obviously have been relegated to the shelf by LHARC and PKAZIP. PAK is still handy for BBS sysops, as it lets them upload compacted packages that can then be downloaded and expanded by anyone, whether or not they have a decompression program.

Picking a clear winner between LHARC and PKAZIP, however, is more difficult, because the issues to consider go beyond size versus speed. PKAZIP has other benefits on its side, such as adding 32-bit CRCs (Cyclic Redundancy Checks) to each file's header, thus providing greater data integrity. How much difference does this make? Keep in mind that one prominent Amiga developer recently banned the use of LHARC for in-house file transfers after finding that LHARC sometimes lost pieces of archived text files. More important for beginners, PKAZIP sports an Intuition interface, while LHARC uses a traditional command line. To decompress a .zip file, you simply point and click, but you must type LHARC x filename.lzh to unravel an .lzh file.

The easiest to use, PKAZIP also has the best user support: PKWARE operates a BBS in Wisconsin. For the tinkerers and customizers, source code for LHARC is distributed free along with the program. PKAZIP is shareware (a $23 donation is requested) and more closely guarded; PKWARE does make the archive data formats for PKZIP/PKAZIP available, but does not include the source code with the program.

Active uploaders be warned: Some boards police the use of certain compression formats. At this writing, GEnie and CompuServe limit the use of .zip files, and BIX restricts both .zip and .lzh files. Fortunately, PeopleLink has no restrictions. Such limitations are not only premature, but can also discourage new users from telecommunications on the Amiga. For novices, clicking a few buttons on the PKAZIP screen is much easier than typing commands in the CLI. E-mail your sysop and demand the freedom to choose your archiving format.

For users who want to compress files only to conserve space, and don't care about speed and other factors, LHARC is the best choice. You will be doubly pleased with the results when storing mostly graphics.

If you plan on doing a lot of downloading from networks and BBSs, I recommend keeping copies of all four programs in your C: directory. In that way, you can always decompress any interesting files you find, including any new archiving challengers that might come along. ■

Graham Kinsey is a former product demonstrator for Commodore and has written extensively about public-domain software. Write to him at 830 Maguire Rd., Kennebunk, ME 04043.

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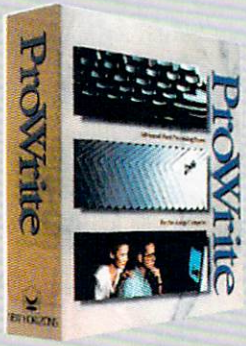
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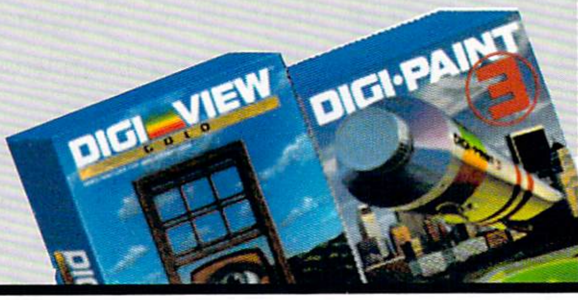
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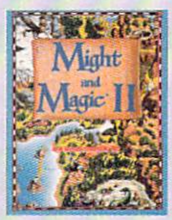
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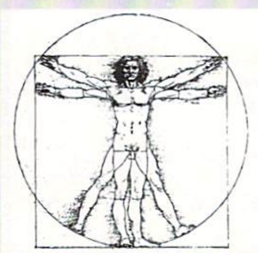
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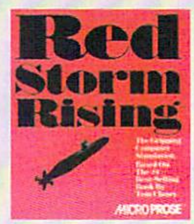
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HAM Shadow Painting

#18

A continuing series of tips, techniques, and tricks for creating more imaginative Amiga graphics.

By Joel Hagen

STAYING WITH HAM and Digi-Paint (NewTek) a while longer, *Accent* this month again focuses on techniques relating to the fundamental use of light and shadow. But while previous columns explored Transparency settings and brush wraps as "automatic" ways of painting objects highlighted by apparent light sources, this time we will look at a simple method of laying in more dramatic shadows by hand in order to define shape and volume.

Casting the First Stone(s)

For the illustration accompanying this column, I was tempted to use a more complex painting, but decided that a simplified demonstration painting would better clarify the technique. Rocks are a great subject for experimenting with shadows. If you do not live near a rocky landscape, gather stones from a road or chunks of cement from an empty lot. Arrange these on your desk in different compositions and put a strong light on the display. Observe the shadows of the stones on the surface as you change the direction of the light.

As an exercise, I once placed nine beach stones on a sunny shelf, rearranged them every morning for a month, and did a drawing of each new arrangement. Those thirty drawings gave me some of my most valuable insights into light and shadow. Stones are so varied in shape that a beginning artist with poor rendering skills can be free to focus on particular considerations such as light and shadow. If you feel frustrated trying to paint portraits, take a break and try stones awhile.

I painted the "Rocks" illustration with a very limited set of tools and the default palette—doing the base painting in the Range mode and all the shadows in the Darken mode. To provide a background for the stones, first paint sky and ground. The sky is a Range of light blue at one end and brown at the other. Random dither provides a nice blending of colors. Set the left and right Transparency controls to the top, fully Opaque. Select the Horizontal Hotspot and slide it to the top of the Control window. Using the Filled Rectangle tool, drag out a box from the top of the screen to a horizon line and let it fill. Keep your horizon fairly low on the page for pleasing pictures. Repeat the procedure for the ground with a new Range of colors. Notice the interesting effect of using brown at one end of the sky Range. The sky then harmonizes nicely with the earth colors.

To paint the basic form of the rocks, set the left Range color to light gray and the right to dark gray. Select the Point Hotspot and slide it to the extreme upper-left corner of the Transparency window, indicating a light source from that direction. Leave the Transparency sliders at the full Opaque setting and select the Filled Freehand tool from the Tools menu. You are then ready to paint some rocks. Learn to use keyboard shortcuts while you paint, such as the u key for Undo and the Escape key to toggle the menu on and off. Keeping your left hand on the keyboard and using keyboard commands as often as possible will allow you to concentrate on painting without the distraction of continually moving the cursor away from the painting to the menu area.

Paint all the back rocks first so they look natural as the foreground rocks partially cover them. Keep the shapes

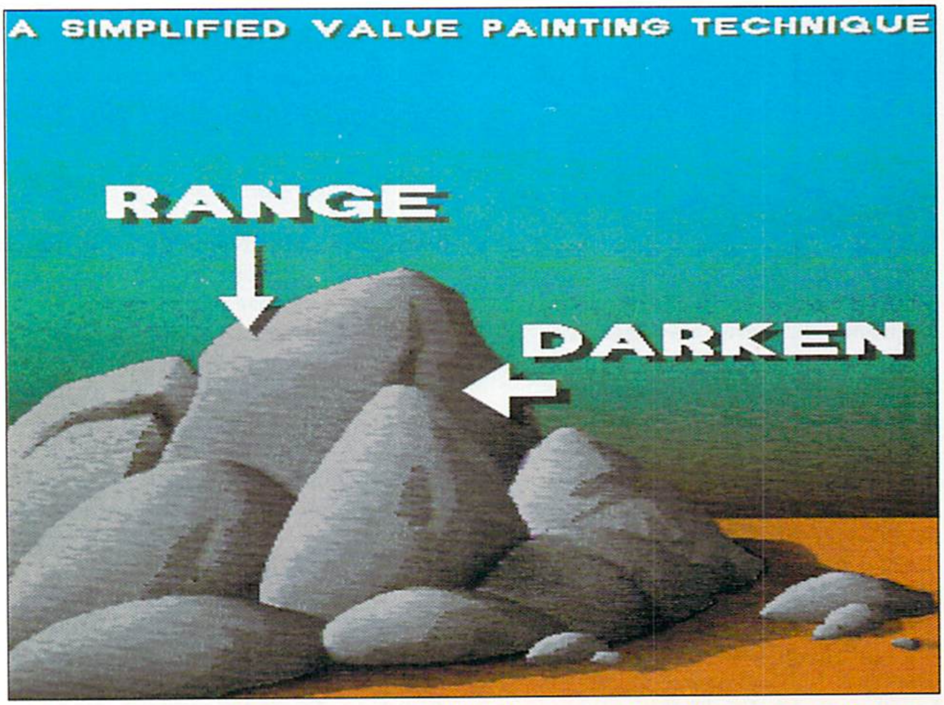
This simple but effective technique for painting with shadows in HAM mode will add dramatic depth and dimension to your images.

simple and vary the sizes. Try to keep them attached to the ground, especially as you move toward the foreground. Do this by flattening the bottom of the rocks, making it seem as though they are partly buried. The line you draw for the bottom of the rock is actually the line of the ground surrounding it.

STEPPING BACK INTO THE SHADOWS

Notice that the Range of light-to-dark gray already gives a slight sense of dimension to the rocks. It is a soft gradation of low contrast values across the surface. At this point, the rocks do not look very impressive, but the next phase will define form and add dimension. Select the Darken mode from the menu. In the Transparency controls, set the left Hotspot slider about one-third of the way down. Set the right Edge slider about two-thirds of the way down. Leave the Hotspot in the upper left to make the darkness of shadow most intense at that edge. Using these settings, paint the shadow of the rocks on the ground. Trace the edge of the rocks fairly carefully; then draw a simple irregular shadow extending away from the light source. Using Undo, experiment as much as you feel necessary to get a good shadow. This effect alone will make the stones seem more firmly fixed to the ground.

Now comes the fun of shading the rocks themselves. Set the Hotspot close to the center of the red ball in the Transparency controls. This softens the edges of shadow areas just slightly, although you still want them crisp for this exercise, because the outline of each shadow will define the surface of the stone. In your mind, trace over this surface as you draw a shadow area in the Filled Freehand mode. This same technique would apply to portraits, where your imagination guides a shadow line around a cheekbone, over the cheek, and finally under the jaw to vanish. Imagine the same character of contours in the rock as you work.



In "Rocks," the base painting was done in Digi-Paint's Range mode and the shadows in Darken mode. Notice the near-black areas ("optical darks") in some of the corners of the darker shadows.

Keep your first shadows simple shapes, as in the example. Select a few areas of the painting where you want to push the space back into deeper shadow. Make second, and even third, shadows in these areas. Down in the corners of two or three of these darker shadows, you can create "optical darks" by making successively smaller shapes that darken the "corner" to near black, as you see in the illustration. Be sparing with optical darks; but including a few of them in a painting will make the space "pop." When you feel comfortable with shadows on simple rock shapes, pull some old artwork into Digi-Paint and try using this simple Darken technique to add depth and dramatize the forms. ■

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a stamped, self-addressed envelope for a reply.

Back to Basics Part 7

Our AmigaDOS experts wrap up their miniseries for new users with some final Shell commands.

By Mark L. Van Name and Bill Catchings

AT THE END of last month's column, we promised to reveal the bigger story behind our simple trick for stopping a command's output. This month, we make good on that promise, and show you a few of the most important Shell commands as well.

When you type a space to halt a command's output, what you are really doing is beginning a new command. The Shell halts the output of the current command so that you can see the one you are typing. This ability to enter one command while another is running is known as "type-ahead." If you type an entire command and then press ENTER, the Shell finishes the command that was already running, and then immediately starts on the one you just entered.

In some instances, you may change your mind about entering another command. If so, you can delete the characters you have already typed by using any of the command-line editing tricks we covered in the past few columns. When you delete the last character, the Shell recognizes that the command line is empty, and it gets on with the stalled command. This explains why the space/delete trick presented last month works: The space bar stops the output as the Shell waits for a new command, and the Delete key removes that space, informing the Shell that you will not type a command after all.

One nifty feature of the Shell's type-ahead facility is that all the command-editing and history-buffer features are at your disposal while you are entering this next command. For example, hitting the Cursor Up key (↑) while a command is running not only stops that command's output, but also allows you to see the previous command in the history buffer.

CHANGING DIRECTORIES

So far, we have concentrated on different techniques for entering and editing Shell commands in general. But what about the commands themselves? Although we do not have room in this column to cover all of the Shell's commands—there are over 60—you can get by nicely knowing only a few.

We have already mentioned the three commands that give you information about what is on your disks: INFO presents the name and amount of free space on every disk in your Amiga, while DIR and LIST display information about the files in your current directory. To move to a different directory, you need a new command, CD (for Change Directory).

CD is the Shell's equivalent of opening a Workbench drawer. If you give it the name of the directory you want to enter, it puts you in that directory. For example, to enter the C directory, which holds the Shell commands, enter

```
CD C
```

(This assumes you're in the top, or root, directory of your Workbench disk.) Doing a DIR or LIST now shows you the names of all the Shell commands.

Like the drawers in Workbench, The Shell's directories on a disk form a hierarchy. A directory can contain other directories, each of which can in turn contain further directories, and so on. The top of the heap is the root directory of each disk, the name of which is simply the name of the disk itself.

The CD command gives you several ways to move around in this directory hierarchy. In its simplest form, as in the example above, it lets you enter any directory within the current directory. To move up one level in the hierarchy, use the slash (/) special character. For example, to move into the S directory that is within the root directory, enter

```
CD /S
```

The / moves you to the root directory, and then the S takes you into the S directory. You could also have done the same thing with two separate commands:

```
CD /
CD S
```

Another way to move to a directory is to jump directly there by entering that directory's "full pathname." A full pathname starts with a disk name and then lists every directory you must enter to reach your goal. The slash separates the names of those directories. Thus, you ►

could enter the Workbench's S directory directly, no matter what directory you were in, simply by typing

CD WORKBENCH1.3:S

In place of the name Workbench, you can also substitute the name of the drive in which that disk is currently held. For example, if your Workbench disk is currently in your Amiga's internal drive (Shell name DF0:), you could get to S by typing

CD DF0:S

These variations on the CD command will work no matter how complex your directory structure. For example, the Workbench disk contains a directory named FONTS, which in turn contains a directory named RUBY. To enter RUBY from the S directory (where the last command put you) you could use any of these CD commands:

CD WORKBENCH1.3:FONTS/RUBY

or

CD DF0:FONTS/RUBY

or

CD /FONTS/RUBY

or, taking the slow, one-step-at-a-time approach, even:

CD /
CD FONTS
CD RUBY

Basic File Manipulations

Once inside a directory, you can perform a number of basic—and consistently useful—operations on the files contained there. The simplest and easiest one is to run those files that are programs. Simply type the file's name. You have already run programs, perhaps without knowing it, because every Shell command is actually a small program.

Another common operation is to see, or TYPE, the contents of a file. If you go back to the S directory and do a DIR, you will see several files, most of whose names include STARTUP. These files contain Shell commands that different parts of your Amiga run when they start. To see what's in the file SHELL-STARTUP, which the Shell runs every time you start it, enter:

TYPE SHELL-STARTUP

(To understand the commands in that file, you will have to do a little more research—but let's ignore them for now.)

TYPE will work on any file, but you will be able to read its output only if the file contains plain text. Try TYPE on a program file, for example, and your screen will fill with garbage.

Two fundamental file operations remain: copying and deleting—the commands for which (COPY and DELETE, respectively) are certainly straightforward enough. To make a copy of the SHELL-STARTUP file, enter

COPY SHELL-STARTUP TEMP

The file named TEMP now contains the same text as SHELL-STARTUP. If you find it helpful in remembering which file the Shell is copying to which other file, you can add the optional word TO, as in

COPY SHELL-STARTUP TO TEMP

To delete the temporary file that you just created, enter

DELETE TEMP

Be very careful with this command, however, as its effects are final; once you delete a file, it's gone.

No Next Time

With the information we have discussed in this "Back to Basics" series, you're ready to take on the Shell and the rest of its commands. As always, the best way to learn how each command works is to read its description in the AmigaDOS manual and then play around with it. Be sure, of course, to restrict your experimenting to a copy of your Workbench disk; keep the untouched original in a safe place. If anything goes wrong, you can always pull out your original disk and start over.

We won't be be with you for the rest of that learning experience, however, because after 4 years and 39 columns, this is the last *info.phile*. You will still be able to find us in the pages of *AmigaWorld* from time to time—look for our in-depth analysis of AmigaDOS 2.0 in upcoming issues—but *this* column is history. Take care, and enjoy your Amiga! ■

Mark L. Van Name and Bill Catchings are contributing editors to AmigaWorld. *Write to them at 10024 Sycamore Dr., Raleigh, NC 27613.*

Graceful Exits

By Robert J. Mical

WRITING A PROGRAM that behaves well in an error-free environment is relatively easy, *if* you can find such a setting. Errors do crop up, and as a program grows in complexity, it becomes increasingly difficult to exit gracefully when an error or abort condition arises. Past frustrations have helped me evolve a programming style in which I construct programs to exit cleanly back to the system, no matter what caused the exit and whether the program run was partial or complete. A discipline as much as a style, its two cardinal rules are:

- Systematically track which resources have been allocated and systematically free them all.

- Always check for error conditions and react to them immediately.

The hardest part of following the discipline is being consistent, making sure that you always write the code as you are supposed to. Once you get into the rhythm of taking the required steps, however, it becomes natural, and you will automatically create robust, crash-free code. (While the examples here are in C, the concepts and style apply to all languages.)

As you will see, I am a proponent of keeping everything simple, even when it means doing things the long-winded, safe way rather than taking shortcuts. The easy-to-understand way often translates into the *fat* way, but the convenience, readability, and aesthetic completeness of coding "in long-hand" are, in my mind, well worth the small increase in code size and decrease in performance. You can always slim down the code during alpha testing.

Under this simple, long-hand programming, my main programs typically look like this:

```
VOID main ( )
{
  if (Init( )) DoMainTask( );
  CloseEverything( );
}
```

Even my mother could understand it: First, Init( ) performs the program's initializations, including the attempt to allocate system resources. If any one of the initializations fails, then Init( ) returns the BOOL value FALSE. If all of the initializations were successful, then Init( ) returns TRUE. If Init( ) is successful, then we DoMainTask( ). Finally, in all cases, we CloseEverything( ) to close and free all things, returning allocated resources to the system.

Main( ) is also a micro-example of the graceful exit discipline. In Init( ) and DoMainTask( ) we get the resources, and in CloseEverything( ) we give them all back. In addition, the program abandons further execution as soon as it detects an error [don't DoMainTask( ) if Init( ) fails]. Let's look at some example Init( ) and CloseEverthing( ) routines:

```
/* Declare resource global variables to have NULL values */
struct IntuitionBase *IntuitionBase = NULL;
struct Window *WorldWindow = NULL;
struct Remember *GlobalKey = NULL;
BOOL Init( )
/* Returns TRUE if all inits succeeded, else returns FALSE */
{
  BOOL retvalue;
  /* Set to return FALSE until we're sure all is well */
  retvalue = FALSE;
  /* Do initializations. If any one fails, goto DONE */
  if ((IntuitionBase = (struct IntuitionBase *)
      OpenLibrary("intuition.library",0)) == NULL)
    {
    printf("error: couldn't open intuition library\n");
    goto DONE;
    }
  /* Another example of an init (routine defined below) */
  if (NOT AllocBuffers( )) goto DONE;
  /* All inits were performed successfully, so return TRUE */
  retvalue = TRUE;
DONE:
  return(retvalue);
}
CloseEverything( )
/* Checks which system resources were allocated and
* frees them */
{
  if (IntuitionBase) ►
```

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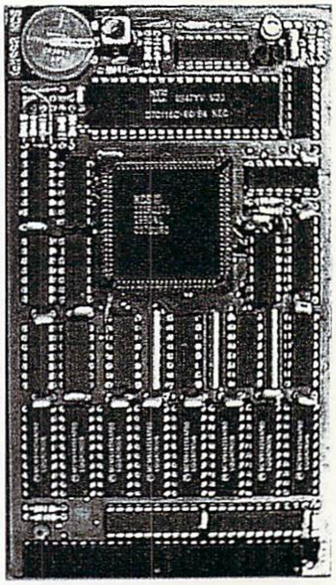
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```
    {
    /* We opened the library. Did we manage to allocate
    * any other Intuition-specific resources? */
    if (WorldWindow)
      {
      CloseWindow(WorldWindow);
      WorldWindow = NULL;
      }
    FreeRemember(&GlobalKey, TRUE);
    CloseLibrary(IntuitionBase);
    IntuitionBase = NULL;
    }
}
```

As the example shows, you can use global variables as indicators to track which resources have been allocated. You start by explicitly initializing your system-resource global variables with NULL values. Variables declared in this way will have non-NULL values only if system resources have been allocated. By detecting whether the value is non-NULL, you can determine whether a resource needs to be freed.

Consider the IntuitionBase variable in the above example. If IntuitionBase is NULL, then the library was never opened, and the Intuition-specific resources can be ignored. If IntuitionBase is non-NULL, then the library was opened successfully, so you must close it. In addition, you should check the Intuition-specific variables for non-NULL values, and, if some are found, you must free their resources, too.

Notice that I set my global variables back to NULL after I freed the resources associated with them. If you're *sure* that your program will never do anything else after you call CloseEverything( ), then this is unnecessary. I'm never sure, however, that I'll remember tomorrow the things I promised myself today. Tomorrow I may accidentally call CloseEverything( ) more than once when exiting, or I may think to use CloseEverything( ) to effect a cold restart of the program. So, choosing to do things the fat, safe way, I reset the variables to NULL. Tracking resources this way is part of the rhythm of this graceful exit style. I follow this rhythm, always following the rules the same way, and it always works.

The philosophy for error handling is: Always detect and report error conditions, and no matter how deeply nested your routines become, always leave yourself a clear exit path where no more program logic will be executed should a fatal error be encountered.

There are low-level routines that check for errors in the system (couldn't open a given file, couldn't allocate memory) and higher-level routines that check whether the low-level routines failed. Low-level routines always return a value that indicates success or failure (BOOL routines would return TRUE or FALSE, while a memory-allocation routine would return a valid memory pointer or NULL). When a low-level routine finds an error, it prints an error message and returns a failure result. Higher-level routines may themselves return a value that indicates success or failure, or they may simply cease execution and return as soon as an error occurs. The higher-level routines usually don't print an error message.

For example, a general-purpose memory-allocation routine could be written to print an error message on failure as below:

```
/* These resource global variables are NULL unless
* their associated buffers have been allocated. */
UBYTE *Buf1Ptr = NULL;
UBYTE *Buf2Ptr = NULL;
UBYTE *XAllocMem(size, types)
LONG size, types;
/* Tries to allocate specified mem, prints error message
* on failure, returns pointer to memory or NULL. */
{
  UBYTE *ptr;
  if ((ptr = AllocMem(size, types)) == NULL)
    printf("error: out of memory\n");
  return(ptr);
}
BOOL AllocBuffers( )
/* If all buffers are allocated, returns TRUE, else FALSE */
{
  BOOL retvalue;
  retvalue = FALSE;
  if ((Buf1Ptr = XAllocMem(BUF1_SIZE, BUF1_TYPES))
    == NULL) goto DONE;
  if ((Buf2Ptr = XAllocMem(BUF2_SIZE, BUF2_TYPES))
    == NULL) goto DONE;
  retvalue = TRUE;
DONE:
  return(retvalue);
}
```

and add these statements to the CloseEverything( ) routine:

```
if (Buf1Ptr)
  {
  FreeMem(Buf1Ptr, BUF1_SIZE);
  Buf1Ptr = NULL;
  }
if (Buf2Ptr)
  {
  FreeMem(Buf2Ptr, BUF2_SIZE);
  Buf2Ptr = NULL;
  }
```

You will notice in the AllocBuffers( ) and Init( ) routines that I've used the dreaded Goto command, which often causes contention among programmers because it's against the "structured" style of programming. Actually, the Goto is the only non-structured aspect of this style, and I use it in a structured way. In both styles, the program logic always flows through routines from top to bottom, except for ►

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the for( ) and while( ) loops. In this style, the Goto is allowed as long as the destination is below the command, thereby maintaining the downward flow of control through the routine. Both styles avoid the nightmare of spaghetti code. Consistent use of the goto makes the code easier both to write and to understand.

Let's examine the error-return routine more closely. When a routine is going to return a result that could indicate an error, as in AllocBuffers( ) and Init( ), the return result variable is initialized to a failure result at the top of the code. Any error within the body of the routine causes control to go to the end of that routine, where the error result is returned. Only if everything goes well is the return variable set to a successful result and then returned.

The error-return routine is one of the basic building blocks of this graceful exit style. Knocking out BOOL functions as a matter of course is part of the rhythm. I create these error-return routines so often that I have defined a function-key macro in my favorite text editor (Cygnus-Ed) in order to add the body of a BOOL function to my source code. I type in the following

```
BOOL Mumble( )
{
}
```

and then hit a function key, which adds a bunch of text to create this:

```
BOOL Mumble( )
{
   BOOL retvalue;
   retvalue = FALSE;
   retvalue = TRUE;
DONE:
   return(retvalue);
}
```

Et Voilà. Then I fill in the body of the routine, using "goto DONE" whenever an error has occurred. Because I do this with every routine that could abort due to a failure, an error result can easily be propagated all the way back to the top—with no more program logic being executed on the way—no matter how many levels deep I get into routines calling other routines.

You may think you'll never look at a piece of code again, but sometimes, then, you're tormented by it for years to come. So discipline yourself to make safety-coding techniques like these a natural part of your programming style. You'll be a happier and better programmer if you do so. ■

Robert J. Mical was a member of the original Amiga design team. Write to him at 999C Edgewater Blvd., Suite 123, Foster City, CA 94404.

THE GAME PRESERVE

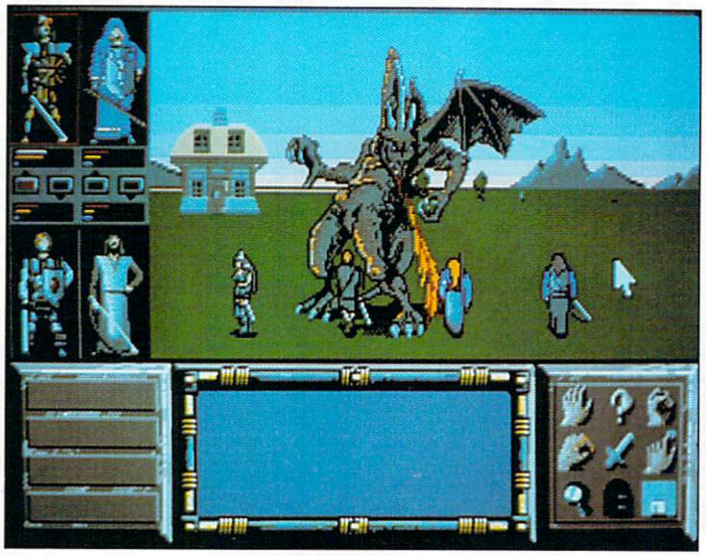
Drakkhen and the Chamber of the Sci-Mutant Priestess

By Peter Olafson

EVERY SO OFTEN adventure games arrive that change the way we think about play and the Amiga. Following the ground-breaking traditions of The Bard's Tale, Faery Tale Adventure, Ultima IV, and Dungeon Master, Drakkhen (from Data East's Draconian line) is a massive 3-D quest to save the dragon kingdom from destruction.

Few detailed 3-D worlds are as unfettered by the machine or as alive with possibility as Drakkhen's. This is the first game I've seen with a 360-degree perspective rendered in something more elaborate than standard polygon-fill graphics and in which both animated characters and monsters appear in your main travel window, imparting a you-are-there immediacy. The surface of the dragon island consists of four distinct terrains—desert, steppe, swampland, and arctic waste—rendered in basic geometric shapes and decorated with trees and shrubs handed down from Space Harrier. (That's a compliment.)

The interiors of the many castles are drawn in dusky detail. Here, in the meat of the game, you have almost total freedom of action. You can send each character on an individual mission or choose one to lead the others. Hint: When possible, stay together. . . unless you want to face alone



Can you save yourself, let alone the dragon kingdom?

the seemingly endless array of bizarre creatures—lizards, Chinese dragons, vector-graphics men with swords, and a huge red silhouette murmuring "I love you" in both female and male voices. You'll die often, and you'll enjoy every moment of it.

The game pays great attention to the fine points. Sounds, in excellent stereo, appear to be place- and time-sensitive. The puzzles are sinister and logical. Horizons change color even when you watch from indoors through windows. Buildings grow subtly larger as you approach. Monsters know when to run, if not when to fight. If you want to see exactly how fast your Amiga can fly, try using a teleporter. I've yet to see a flight simulator move this fast and preserve this much detail. As a graphic engine, Drakkhen is staggering.

As an adventure gaming system and a scenario, however, it wants a bit of fleshing out and articulation. For example, the game claims to have more than 200 spells; actually it has 200 on-screen "visualizations" of the 23 spells documented in the instructions. Casting most of them is easy enough once you recognize their runic spellings: Just click down a list and push the right mouse button while pointing at the character. In combat, they can be cast automatically and therefore accurately. In peacetime, however, the success of healing ►

Crib Notes

By Peter Olafson

• THE WEAPON STORE off to the north at the start of *Drakkhen* (Draconian, $59.95) does have some nice stuff, but if you think it's vastly better than what's in the first castle, you're not being thorough enough there. Did you really take a look around the prince's room? Don't be frightened of him; he's just sort of a twitchy guy. Yeah, that's it. Take it, take it. (Then go outside, save, come in, take it again, and so on.) Don't chat up the prince much; he'll chase you out with spells. You should leave his place armed to the teeth. Make a point of raiding the temple (second floor on the right) to replenish your stock of magic items. You should be able to enhance the critical stats of each party member by the time you leave. Stock up on keys, too, as you can use them interchangeably.

Finding his sister's castle, as the prince instructs, is a bit tricky. Yes, it's to the east, but which way is east? Well, it's where the sun comes up, and if the sun isn't handy, the mountains on the eastern horizon are a little different from the others. The trip is not a straight shot, however; your route is blocked by a north-south line of glowing white triangles. Don't try to cross them (though it's an interesting way to die); make an end run.

When you get back, the prince will send you north to the Prince of Water's castle. Once again, his directions are sloppy. It's really west, north, west (around the inn), and then north again. He neglects to mention that the castle's drawbridge will quickly turn your party into a bloody pulp, as well. One particular spell is called for here. While no spell is specific to the task, one has the right effect. It's the only logical selection. ►

spells relies heavily on precise positioning of your characters. Reeling them off with any authority is difficult, and the documentation is mute on the subject. (Filling empty flasks without drowning a character is equally challenging.)

Character control indoors is another sore point. The adventurers do a decent job finding their way around furniture without your help, but they can also stumble about as though they're playing soccer with an invisible ball. You have to click the mouse on a clear section of floor to get them to stop fidgeting.

Drakkhen is a throwback in certain respects. Your quest to collect the eight dragon gems really isn't much more than a treasure hunt. Experience is gained mainly by beating up on everything in sight, and character interaction seems a bit archaic in these days of non-player characters with multiple-word triggers. You can't do more than "greet" and "question," and in most cases, the burbling little men beside the road come right out and tell you their life stories. (Repeated questions and a sheathed sword sometimes pay off.) Finally, the manual needs an orientation section; starting Drakkhen cold is rather like being dropped out of a helicopter into a war zone. I'd gladly trade in the fantasy miniature that came in the box for even a partial map or an on-screen compass.

These shortcomings, however, can be addressed in the promised sequel. Even with flaws, Drakkhen is an outstanding technical achievement, a compelling adventure, and an audio-visual feast.

If you'd like a more compact and polished game, try Draconian's: **Chamber of the Sci-Mutant Priestess**, Drakkhen's impressive companion release. It's essentially a puzzle game in adventure clothing, with a wickedly smooth graphic interface. You can click the mouse virtually anywhere and bring up a menu of options that's mounted on a brain, of all things. Even better, Chamber is that rare game in which the computer intermediary is almost invisible. After a while, you'll find you're doing all your thinking with your mouse.

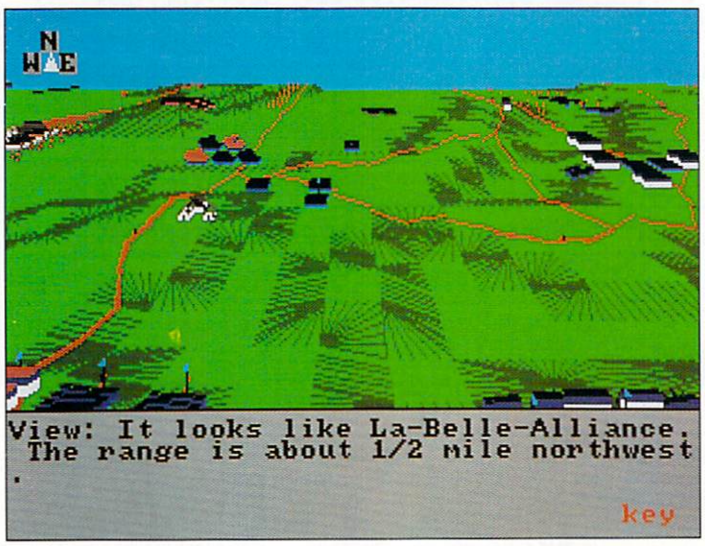
You have to solve five ordeals to free the beautiful goodie-goodie Sci-Fi and thwart a plot by the lizard-faced Protozorqs. It's all great fun, and, while five puzzles may sound like barely an afternoon's work, you won't finish this game quickly. Most solutions aren't at all obvious. You'll always find something to manipulate or animate, someone to talk to, or something to make you laugh. A light European wit is at work in the responses, and I defy you to read the docs with a straight face.

I heartily recommend both these newcomers. *($59.95 each, Draconian, distributed by Data East, 1850 Little Orchard St., San Jose, CA 95125, 408/286-7074. No special requirements.)*

WATERLOO

By Kevin C. Rohrer

THE DATE: JUNE 18, 1815. The place: Belgium. The French dictator Napoleon Bonaparte has returned from exile and rebuilt France's La Grande Armee. The Allied armies are responding by moving to invade France. Unfortunately for them, Napoleon is aware of their plans and is moving to intercept. The two closest armies are under the English Duke of Wellington and the Prussian Blucher. Bonaparte beat Wellington at La Belle Alliance and Blucher at Ligny, and hopes to finish off the English near the town of Waterloo. With SSI's new war game, Water- ►



Issue your commands, then trust your corps commanders' skills.

This castle is much tougher and longer than anything you've dealt with so far. For now, don't waste time on doors you can't open. (They're probably broom closets. I'll let you know later.) Do pay attention to doors you can't always see. There's more here than meets the eye; if you haven't teleported, you haven't seen it all.

• Those of you having trouble with the steering in *Hard Drivin'* (Domark, $49.95) should remember to watch the speed limit signs (they're there for a reason), and to steer with small, incremental mouse movements. That's all that's required; anything else is likely to send you into off-road 360s in a hurry. You'll eventually learn to switch off between the accelerator and brake on the fast track.

• To Valerie Kilgallon, who's out hunting for a wick for the bomb at the end of *Leisure Suit Larry II: Looking for Love in Several Wrong Places* (Sierra On-Line, $59.95): You are picking up everything not nailed down, right? If so, it's the only combustible item in your inventory. If not, well, it's in "plane" sight.

• Is your town not growing too slowly in Sim City (Maxis, $44.95)? Don't tax for 11 months of the year. The Sims are all nasty little conservatives, and they love not having taxes. The city will grow like a weed. Come December, however, tax them into the ground—to the tune of, say, 20 percent. You'll collect a bundle in January. When the budget box turns up that month, pretend you're running for re-election and eliminate the taxes again. Sims have a short memory, and they'll flock to your city once more.

• You can get rid of the rocks messing up your nice flat plain in *Populous* (Electronic Arts, $49.95) by lowering the land at each of its four corners and sending it to a watery grave. (Your men will take care of the trees themselves.) Once you have a castle, and a nice big field for your walkers, build up the land by one level at one corner of the castle, reducing it to a house. When the dispossessed walker appears, wait for a couple of seconds, and then lower the land. You'll have your castle again, and the walker will ►

build one, too. (If you don't wait, he'll just go home to the original castle.)

• Make note of the call numbers accompanying the appearance of ships in *Federation* (Spotlight Software, $49.95). When you have a moment, go on the blower (Galnet) to them. You can have a nice chat, and sometimes you can trade on the black market.

• Michael Smith of Belleville, Ontario, writes that when he's playing *Falcon* (Spectrum Holobyte, $49.95) at the Major level, he keeps crashing without explanation while landing—even though he's doing everything right. Mike, did you take any damage during the mission? An early version of Falcon has a bug that causes a crash landing if you're at all shot up. It's fixed in version 1.1, which also makes the landing process easier in general. If you're using 1.1, the only requirements for a safe landing are a speed of under 300 knots, a climb angle between 25 and −18, and a banking angle of less than 20 degrees either to the left or to the right, according to the Falcon guide *Turn and Burn* (Compute! Books, $14.95). The landing gear must be down, as well, but you knew that.

COMPANIES MENTIONED:

Compute! Books, Chilton Book Company, One Chilton Way, Radnor, PA 19089, 215/964-4708.

Domark, distributed by American Software Distributors, RR 1 Box 290, Bldg. 3, Urbana, IL 61801, 217/643-2050.

Draconian, distributed by Data East, 1850 Little Orchard St., San Jose, CA 95125, 408/286-7074.

Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171.

Maxis Software Inc., 953 Mt. View Dr., Suite # 113, LaFayette, CA 94549, 415/376-6434.

Sierra On-Line, PO Box 485, Coarsegold, CA 93614, 209/683-4468.

Spectrum Holobyte, 2061 Challenger Dr., Alameda, CA 94501, 415/522-3584.

Spotlight Software, distributed by Cinemaware Corp., 4165 Thousand Oaks Blvd., Westlake Village, CA 91362, 805/495-6515.

loo, you can decide his fate.

Waterloo is unique in several respects. It is the first war game in which each player (up to two are allowed) not only takes on the role of a general, but also views the battlefield through his eyes, as opposed to seeing an unrealistic "god's-eye view" of the entire landscape. Secondly, you can't control your units' actions; instead, you give up to eight orders per turn to your corps commanders by typing instructions (for example, "Lobau shell Mont St. Jean for three hours"). The commanders then follow the orders to the best of their abilities. The view becomes even more realistic as "fog-of-war" conditions settle in: A commander can see only what is within his range of vision, and can gain further information on the action only from sporadic and possibly unreliable battle reports. Units are identified by clicking on them.

The game's graphics are also different. Standard military symbols and toy-like icons have been replaced by multicolored rectangles and squares that depict units just as they would appear in real-life from a distance. The program redraws the screen whenever units move or a player's view changes. Sound is absent, but unnecessary; this is a thinking person's game.

The game's rules are easy to understand, and setup is even easier, but there's still room for improvement. Only the Waterloo battle is available. I would have prefered to re-create the two earlier battles as well, and to have been able to modify the expertise of the troops and their commanders. Judging distances is also diffi-

cult, even with the map provided, and determining how long orders will take to reach a unit and be carried out is a matter of experimentation.

Whether you want to change the course of history or are just looking for a good fight, give Waterloo a try. *($59.95, Strategic Simulations Inc., distributed by Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171. No special requirements.)*

NUCLEAR WAR

By Graham Kinsey

IF YOU FEEL you can laugh at war after the recent political changes, then Nuclear War will give you a good chuckle. As president of a member nation of the exclusive "nuclear club," you do battle with four powerful, computer-controlled world leaders (including Ronnie Raygun, Ayatollah Kookamamie, Ghanji, and Tricky Dick). Each player starts with five well-populated cities that create the toys of nuclear destruction on command. These cities and their populations are the keys to success, for the number of people in your country (or empire) determines how many nuclear items can be produced in one turn. (Lose your total population, of course, and you lose the game.)

In each turn, you choose one of three options. First, you can order your people to produce nuclear bombs, missiles, bombers, or nuclear defense systems (the program decides randomly which are produced). Second, if you feel peaceful but devious, you can assault a foreign city with propaganda in hopes that a few million inhabitants will move to your country. Finally, you can push The Button, and ruin an opponent's weekend! You can transport a bomb to its target via a missile, which is a one-way trip, or via bomber, which can carry multiple payloads and is less vulnerable to defense systems.

To communicate your intentions (or lies) to your opponents, Nuclear War offers the ►



Liar's Poker doesn't get much more high-stakes than this.

Happy Face Diplomacy system. The ten possible opponents in Nuclear War fall into five personality groups, including the dangerous Liars, the simple-to-read Warmongers, and the tough-to-deal-with Pacifists. As if trying to keep all these world leaders on your side (until you nuke them into oblivion) isn't tough enough, you also have to deal with earthquakes, nuclear meltdowns, and the terror caused by the Heinous Heifers.

Nuclear War's graphics and sound are good, as is its compatibility. The game will run on accelerated Amigas, allow multitasking, and install on a hard drive. While Nuclear War is not for those who can't take a nuclear joke, I found it hilarious. *($49.95 New World Computing, distributed by Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171. No special requirements.)*

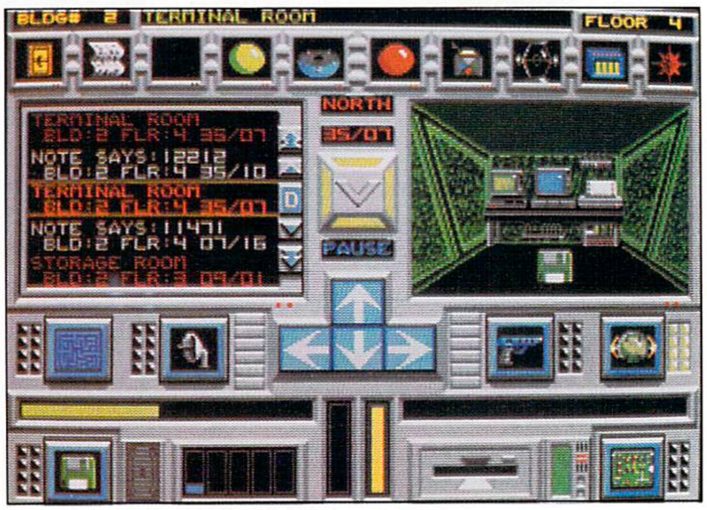
Day of the Viper

By John Ryan

I AM INHERENTLY suspicious of Amiga software that sports IBM screen shots on the package. Happily, my suspicions were ill-founded with Day of the Viper. This gem is 100% Amiga, with all the color, stereo sound, and high-speed graphic action that connoisseurs expect.

The premise of this science-fiction adventure is simple: The year is 2782, and the evil cyborg GAR has entrenched himself in the last defense installation left to humankind. The compound comprises five buildings, each containing five progressively difficult levels filled with traps, robot assassins, and other nasties. Your task is to guide the Viper-5 robot through the maze of hallways in search of tools to destroy GAR and his aluminum-headed minions.

A beautifully detailed screen depicts both a three-dimensional, first-person view of the surroundings and an overhead view—courtesy of automapping. The program not only details where you've been, but also what you've found there. You can pick up, drop, or otherwise manipulate items in various ways, and an electronic notepad automatically



Even automapping can't tell you what lurks around the corner.

records their whereabouts.

The meat of this mouse-controlled game is the chase. While your robot is searching the defense complex, GAR and his gang are out to ruin your day. You must clear out the enemy robots from each building level and fend off attacks from several directions at once. Each of the 30 or so robot variations has its own peculiar weaknesses. Only by targeting these weak spots and exploiting the various weapons you find, do you keep your sprockets firmly in place. Weapons selection, energy management, and knowing when and where to fight are the keys.

Getting started with Viper is easy. The game is copy-protected by password and installs easily on a hard drive. Moreover, the short and informative instructions are geared toward getting you quickly into the game without a lot of fuss. Day of the Viper offers hours of mouse-pounding fun, and no two games are ever alike. *($49.95, Accolade, 550 South Winchester Blvd, Suite 200, San Jose, CA 95128, 408/985-1700. No special requirements.)*

Risk

By Graham Kinsey

SHIFTING THE ACTION from the tabletop to the screen, the Amiga version of Risk retains the original's rules and adds lots of new options. You battle up to five human or computer opponents and can specify three skill levels for computer foes. (The computer's Easy setting isn't really easy at all, as it makes the computer a very reckless and therefore dangerous opponent.)

You can play four varieties of games: the standard short and long U.S. formats or the short and long British variants. The British versions are very different, with automatic territory selection at the beginning of the game and a flat card-exchange rate. In the short UK version, each player has a mission, such as wiping out another player or conquering specific continents.

If you'd rather, you can create your own variation by combining features from the four versions or choosing from the multitude of options. For example, you can specify a low exchange rate for the US games, supply lines (where you can shuffle armies around almost at will), and a limit on the number of armies in one territory. There are also some options to speed up play, including the ability to disable the scrolling effect and the Continuous and Do-or-Die attack modes.

While all these choices make the game seem great at first, it has many very annoying problems. For starters, Risk cannot be installed on a hard drive and does not allow multitasking. (At least it *does* work with accelerated Amigas.) Also, there is no reason why the entire Risk board can't fit entirely in one screen; in the public-domain Risk clone, Jeopard, it does so nicely. The color options are pathetic, and the only nice thing I can say about the sound effects is that you can turn them off. While I liked Risk as far as the options went, it falls short compared to a well-written Amiga war-strategy game such as Empire. *($39.95, Virgin Mastertronic Inc., 18001 Cowan, Suites A & B, Irvine, CA 92714, 714/833-8710. No special requirements.)* ■

from p. 16
unless you use ZapPort on a copy of the AUX-handler file in the L: directory of the Workbench and create your own mountlist entry for the altered copy.

Instead of using operating-system routines to speak to the serial port, most MIDI programs send data directly to the hardware. This means that for the most part, music-sequencing software must support the Serial Solution directly in order to use it as another MIDI port. So far, the only program to provide such support is Blue Ribbon Bakery's Bars & Pipes (a demo copy of which is included on the Serial Solution disk). Bars & Pipes uses the Serial Solution to add 16 MIDI channels to the Amiga's standard 16, making it the first Amiga MIDI program to control up to 32 channels at once.

Checkpoint is also working to add compatibility with programs like Music-X (MicroIllusions) and the Dr. T's line of music software. Because the board has only one 25-pin connector, it can plug into just a single MIDI adapter. Given sufficient demand, however, Checkpoint may supply an adapter for the 9-pin connector, so that you could add another 16 MIDI channels, for a total of 48.

Get It On

Although installation of the driver software may sound complicated, Checkpoint has made it as painless as possible. The supplied software contains an automated installation script that transfers the Exec-level driver to the Expansion drawer of your Workbench disk, moves the AmigaDOS handler to l: directory, adds entries for SER2: and SER3: to the devs:Mountlist file, and plugs commands into your startup-sequence to mount these devices.

For those unfamiliar with editing an icons Tools Types, there is a TSSPref program that lets you set serial-port preferences and automatically change the Tool Types in the driver icon. Its interface is very similar to the serial screen of the AmigaDOS Preferences program. Those wishing to install the software manually will appreciate the fact that the documentation explains this in great detail, even including a checklist.

The Serial Solution provides an inexpensive way to add serial ports to your Amiga 2000 or 3000. It meets the needs of those who wish to use several serial peripherals at once and of those wanting to run serial applications with higher speeds than the standard Amiga port can reliably support. In addition, its exceptional MIDI support makes it the board of choice for musicians who need more MIDI channels.

The Serial Solution
Checkpoint Technologies
PO Box 2035
Manassas, VA 22110
703/330-5353
$199
No special requirements.

Master Sound

Master of none

By Michael Hanish

ACCORDING TO MY records, Master

Sound is the lowest priced eight-bit audio digitizer on the Amiga market today. It captures and plays back high-quality samples, but whether it is a bargain depends on how easy it is to use and how useful the resulting samples are. (To compare Master Sound with other digitizers, see "Sizzling Sounds," Oct '89, p. 48.)

Master Sound consists of a small cartridge and a disk of non-copy-protected software. The hardware fits snugly into your Amiga's parallel port and has just one mono mini-plug (3.5 mm) for input. To hook it up to your audio device, you will probably need either an adapter or a special cable (not many audio devices use mini plugs for output), both of which add noise to the input signal. Another severe design deficiency is the lack of gain control on either the hardware or software. As a result, you must adjust gain through the audio source or through an external mixer, adding inconvenience and, in the latter case, expense as well.

The Master Sound program is relatively small and sports a nice-looking control screen with embossed-style buttons. The top third of the screen shows an approximation of the sample's waveform, once it is in memory. Below this are sample playback and location buttons, styled as on a tape recorder. An oscilloscope in the bottom-right corner should facilitate setting input levels, but in my tests the scope was only moderately accurate. On the bottom-left side are editing controls. Two numerical displays show the cursor location within the sample, and another smaller readout gives the sampling/playback rate.

Recording samples is fairly straightforward. Once you have judged the input level to be adequate by monitoring the oscilloscope and the speaker, you set the sample level—this is difficult to do with any precision—and click the record button twice. (Clicking a third time stops the recording.) You can also set the program to begin recording automatically once the sound reaches a preset level.

The sample rate can be as high as 59.6 KHz, which makes for extremely clean and detailed, though large, sound files. Sounds sampled at very high rates are unusable in programs that limit the rate to 28 KHz, but Master Sound lets you compress samples by 50% and adjust the playback rate. Because the controls are so coarse, however, doing so is difficult. There is no resampling feature.



The Master control screen.

Stormy Weather

A sampler without editing features is like a day without sunshine, and the sun doesn't shine too brightly on Master Sound. Although the standard editing features are implemented (you can mark and magnify sample sections, cut, paste, overlay, and apply filtering and volume changes), the design hinders smooth operation. The sample display is very coarse, which makes it difficult to zero in on editing and looping points.

There is also no undo option, which, coupled with the fact that the controls do not provide leveling (you get your choice only of on or off), makes sample editing a hit-or-miss process. Filtering and Volume Change, for example, operate with a set level, and there is no recourse for a mistake or change of mind. The Overlay effect lets you cut a piece out of a sample and paste it over something else, but I found it almost impossible to blend the level of the pasted section with that of the destination.

Master Sound has a sequencer of sorts: Using it involves pasting all the sounds you want to use into one master sample and assigning each part to a key on the numeric keypad. You can record into each of the Amiga's four sound channels using these keys. The demo sequence on the program disk, produced in this way, hints at some interesting possibilities. Unfortunately, I was unable to get this feature to work, in part because I could not follow the very confusing instructions in the manual.

The manual needs a major overhaul. It is skimpy and vague in every section, but because the software has no pull-down menus or help feature, you must depend on it to explain what each icon and button does. Even those familiar with sampling will find the manual inadequate, and for beginners it will be hopelessly confusing. For example, the rather basic bit of information that there is no button to exit the program is not mentioned until almost the end of the manual, and then only in passing. (The key combination required to quit is buried in a section describing how to make a demo.)

I cannot recommend Master Sound for any purpose other than the very limited one of producing reasonably good samples. Editing requires a separate sample editor such as AudioMaster II (Oxxi/Aegis), which also does a good job of controlling the hardware. I have to wonder what market niche Microdeal had in mind for Master Sound. Its low price makes it attractive to beginners, but the manual rules it out for that segment. There are a number of better 8-bit samplers on the market; I wish the developers had put their talents and time to work on a product we didn't already have.

Master Sound
Microdeal/MichTron
3285 Lapeer Rd. W.
Auburn Hills, MI 48075
313/377-8998
$69.95
No special requirements.

T.A.C.L.

Text-adventure creation on the lighter side

By Dean Friedman

WITH THE RECENT explosion of exciting authoring systems for the Amiga, would-be programmers finally have alternatives to text-intensive languages. In facilitating the manipulation of graphics, animation, and audio, however, most icon-based authoring systems have, to varying degrees, neglected the more mundane job of handling text. For those weaned on text-adventure games like Zork (Infocom), nothing gets the blood ►

flowing like a powerful word parser that interprets conversational keyboard input. Sometimes the only reasonable course of action in an adventure is to see what happens if you have your hero "stick fork in monster's eye."

T.A.C.L., The Adventure Construction Language, is a script-based game-authoring system designed specifically to handle the kinds of logic and language that are characteristic of text adventures. It allows you to display IFF and HAM graphics files and includes a simple utility for generating audio tones across the chromatic scale. It even provides a graphic editor, called VGED (Vector Graphic Editor), with modest paint tools. These enable you to create non-IFF graphics, which take up considerably less room on your disk than IFF files.

T.A.C.L. employs a BASIC-like scripting language that anyone with even minimal exposure to BASIC ought to be able to use after carefully examining the demo scripts included with the program. Even novices should be able to find their way around with some patience and perseverance (although the job would be easier if the manual were less verbose and better organized).

Flex Files

What gives T.A.C.L. its muscle is its game template, which consists of five file categories (Adventure, Room, Object, Subroutine, and Vocabulary) that define separate portions of the game's universe. Following established adventure-game convention, T.A.C.L. provides a format in which the hero moves from one location to another by responding to direction commands (North, East, West, South), collects objects, confronts characters, and acts or is acted upon. Once you have planned out gameplay on paper, you can simply plug the various game elements into the appropriate files.

Creating the Room file involves defining a series of adjacent rooms and then describing the consequences of entering them. Default statements define a room's entrance(s) and exit(s) and provide the means for linking rooms together. Commands are typed in capital letters, while values and variables are not. Descriptive comments, which the program does not act upon, are preceded by an asterisk. Any text you wish displayed during the gameplay must be preceded by the letter T. (Using the Amiga's Say facility, you can opt to have the computer verbalize text as it is displayed.)

The Object file, which defines not only inanimate objects, but also characters, is created in much the same way. You type in the name of the object or character and any synonyms or accompanying adjectives. For example, you could enable the program to distinguish between the silver key and the gold key, or have it understand that light and lamp are one and the same. You can assign attributes or variables to objects (the lamp can be on or off), and you can script events to occur according to the state of those attributes. An object's definition also includes an action (such as open, drop, or throw) and you can link events to occur once that action is executed.

YOUR TURN!

T.A.C.L. is fun to play around with and easy to pick up if you know programming. The manual is not terribly good, though, for nonprogrammers. The interpreter won't wrap text from line to line as a word processor does; it's a pain to realign when editing. I would appreciate an editor that could generate most of the code for you. T.A.C.L. has no interface; it's really just a language and compiler. It is very flexible, however, and you can use it in lots of different ways.

Matt Ritchie
Austin, TX

The Subroutine file provides a means for creating modules (subroutines) for common blocks of script, which can be summoned by a Call subroutine from another file. The Vocabulary file is where you define responses to actions that are not necessarily attached to a specific object. Here is where you can have some fun anticipating the varied commands of the players and responding to them humorously.

The Room, Object, Subroutine, and Vocabulary files are all organized and referred to by the main, or Adventure, file. The Adventure file contains the names of all other files as well as variables that affect the overall game (whether it it daytime or night, for instance), and any password you may require of the player as a type of copy protection.

You can attach graphics and sounds to either rooms or objects, and choose whether they are to be displayed or played before or after command entries. While the graphics editor is modest but functional, audio implementation is decidedly weak. T.A.C.L. supports IFF graphics files, but not IFF audio files.

Once you have created your five files, T.A.C.L. compiles them into compact code and automatically generates the logic routines that keep track of where your player is, what he sees, which objects he possesses, and what conditions he encounters upon taking specific actions—all according to the elements you have scripted. Simply put, you decide what is to occur during the course of the gameplay, and T.A.C.L. makes it happen.

You can test your game from within the PADV (Play ADVenture) module, which offers many options, including toggling between various images and whether you hear audio playback and speech. The PADV player module is freely distributable, so any games you create with T.A.C.L. can be marketed commercially.

A Better Program

What T.A.C.L. does, it does well. By dividing the game universe into five distinct files and automatically incorporating those files into a template, T.A.C.L. drastically reduces the amount of organizing and programming involved in creating games from scratch. I wish, however, that it could handle ANIMs in addition to IFF images, however, and that it handled IFF audio files. Better yet would be an ability to trigger SMUS files, so that games could include polyphonic music sequences.

I would also like to see text input and response on the same screen as the images. At present, text is shown on a separate screen, so the player never gets to view a picture while typing commands. Finally, I would like a simpler program interface with more graphic elements.

T.A.C.L. goes a long way toward minimizing tedious and mundane programming chores, but it seems that even more tasks could be automated. It is true that an adventure game's elegance and complexity is determined by a logical series of ►

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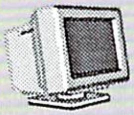
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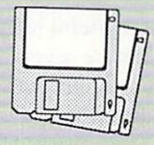
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IF THEN statements, and that these routines cannot be automated without compromising the game's individuality; but still, the option would be nice.

Despite its shortcomings, I like T.A.C.L. At last, lazy folks like me can make text adventures just as programmers can.

T.A.C.L.
Micro Momentum
PO Box 372
Washington Depot, CT 06794
203/567-8150
$49.95
No special requirements.

AZTEC C 5.0a

One more time!

By David T. McClellan

MANX'S AZTEC C compilers have been around for a long time on a number of computer platforms. Amiga version 5.0a comes with a thick paperback manual and five disks. An install procedure on the first disk installs the software on two floppy disks or a hard disk. (Single-floppy systems are not recommended for running the compiler.) In addition to copying disks, the install program is able to do some useful tailoring: The compiler can generate several code and data models (from small to large, *à la* IBM PCs), and four separate floating-point models (Amiga IEEE, Motorola 68881, Amiga FFP, and Manx IEEE).

One complaint is that you must boot from one of the installed disks. I'd like to see an install procedure that adds to your startup-sequence and allows you to edit the results. In order to use the compiler and also my own startup scripts, I had to transfer the Manx files to my boot disk by hand—not a time-consuming process; just inconvenient.

YOU COULD USE SOME Z

There is one tool in this package you may end up using more frequently than the C compiler itself: the full-screen editor, z. Nearly a clone of the Unix vi editor, it has hooks to the compiler for error fixing. The QuikFix compiler option lets the compiler invoke the editor and step you through the source-fixing errors as it finds them. It then automatically recompiles when you exit. Z didn't crash on me (as have some Modula-2 compiler/editors that tried the compile/edit trick), and it makes syntax fixing quick.

The compiler sports a number of other options—CCOPTS, CCTEMP, INCLUDE, and CCEDIT—that you can pass in as command-line switches and provide via Manx-environment variables. Manx variables are not normal Amiga-environment variables; you must set them—preferably in your startup or init-for-aztec script—with Manx's own Set command instead of AmigaDOS's SetEnv. Various switches, similar to those provided by Lattice and Unix Portable C, control the code, data and math models, various optimizations, preprocessing, and debugging.

The 5.0a compiler supports ANSI C conventions, including two extra switches: "-k" for Kernighan & Ritchie C rules, and "-3" for code written using earlier Aztec C versions (3.6 in particular). My only complaint about the compiler is that you can compile only one file at a time on the command line. (If you use the Make utility, this is no big deal, but for compiling several files by hand, this setup requires extra time.)

The compiling process has two visible passes: The compiler itself generates assembly language and passes it to the assembler (which you can also use separately). The assembler generates the .o object files that go to Manx's linker. This process is reasonably fast, and the compiler generates good code.

You invoke the linker separately, passing it the .o files and the libraries you want. It finds the libraries using the CLIB Manx-environment variable, and generates a normal AmigaDOS executable. It also handles segmented (overlay) linkages, and you can choose to include information for the debugger in the executable.

Aztec 5.0a provides three debuggers, a librarian, a couple of object-file and executable-file dissectors, text-file archivers and comparators, and some Unix-like directory utilities. A Make tool uses your text databases (makefiles) of source-file/object-file dependency relationships and rebuild rules to keep your programs up to date. By using the dependency rules and checking last-modified dates for source-file changes, Make recreates executables, recompiling and relinking only when necessary. This tool keeps the edit/compile/link/test cycle simple by doing the bookkeeping and rebuilding for you; you just edit and test.

The three debuggers (one for assembly language and two C source-level debuggers that support different math libraries) are good. SDB, the source-level debugger, provides the usual functions: setting and clearing breakpoints, doing stack tracebacks, examining and setting C variables and memory in several ways, displaying C source, setting chunks of memory to new values, and disassembling object code.

Breakpoints can be unconditional or conditional (for example, "break if sales < 15"). You can attach debugger commands to the breakpoints, single-step through the source, and examine variables at different stack levels (including separate frames of a recursive routine) as bytes of memory or as C-data structures. An especially handy feature is the ability to create debugger macros. SDB looks at least as robust as the other Amiga C and Modula-2 debuggers I've worked with.

Manx's C library supports not only all AmigaDOS and ROM Kernel functions, but also most Unix 5 studio, string, memory, math, error-handling (setjmp/longjmp), and miscellaneous functions, plus a few Aztec-specific ones for stack checking, CLI calls, and such. Their included directory also has function prototypes for all of these, so you can take advantage of the ANSI C argument type-checking and type-promoting features. I ported over several programs I'd done in Lattice 5.0, using the 32-bit integer compilation option, and they all worked fine. Manx supplies a few example files (display hacks and others) for those new to C on the Amiga.

MANUAL TRANSMISSION

The manual describes all the tools, options, and supported ANSI C features, and it provides briefs of the library features, including a handy listing of prototypes for all Amiga ROM Kernel functions. I found a number of minor typographical errors, particularly in the z editor examples, but none are crippling. Documentation on the debugger is sparse in places; several powerful commands are covered only briefly. In- ►

Circle 128 on Reader Service card.

dexes are scattered over several major sections—there's one for the compiler and related tools, one for the libraries, and one for the Uni-Tools (make, z, and so on), and another for the debugger. I needed an index just for the indexes!

Overall, I like the package. Although the manual needs help, the ANSI C support, the depth of the C libraries, and the symbolic debugger are good, and the other tools are useful. Aztec C's main competitor, Lattice C, also provides ANSI C compatibility, good libraries, and a very good symbolic debugger. Both compilers generate decent code. Aztec C provides a 16-bit integer-compiler option that can win some cycles—but so can careful coding, using shorts and longs where appropriate.

Manx's Macintosh compiler supposedly supports the same C language as its Amiga version, whereas Lattice is more into the PC market. If you are writing programs for more than one hardware market, this will determine your choice. If you've already got Lattice 5.0, don't change. But if you have Aztec C 3.46 or no compiler at all, 5.0a may be a good choice for you.

Aztec C 5.0a Professional
Manx Software Systems
160 Ave. of Commons
Shrewsbury, NJ 07702
800/221-0440
$299
No special requirements

ALF2

SupraDrive with WordSync

More drive options.

By Harv Laser

HARD-DRIVE CONTROLLERS come in many flavors. My ever-increasing appetite for storage space recently led me to sample a couple of them, namely ALF2 from Pre'spect Technics and Supra's SupraDrive with WordSync.

Modular Control

The ALF2 (Amiga Loads Faster) controller consists of a base auto-configuring A2000 card (onto which you can mount a 3.5-inch hard drive) with a module to implement the controller function for any of various hard-drive types: ST-412 or -506, SCSI, ESDI, and AT. (An external box SCSI connector is available.) While only one module can be used per card, the ALF2 software allows for multiple cards. This modular concept makes ALF2 thicker than the average board, but allows for great versatility. Unfortunately, you do not have the option of using power from the card for the hard drive.

Included with the installation software are partitioning, partition password-protection, hard-drive auto-parking, drive-backup, and disk-performance programs. The partition password protection can extend to storing the Rigid Disk Block (RDB) autobooting information on floppy, then deleting the RDB partition information from the hard drive, thus virtually assuring complete security and protection from viruses. Although such niceties are available in the public domain, I was pleased to find them included on the installation disk. The software supports both XT and AT Bridgeboards as well as autobooting IBM virtual drives.

ALF controllers come in a variety of models for the A500, A1000, and A2000-series machines. I tested two A2000 controllers of the autobooting variety—ALF2-SCSI and ALF2-RLL—affixing them with various hard drives. (The hardware comes without cables.) The boards themselves appear to be of good quality, with no jumpers or cuts apparent.

All controller modules employ the same software, which is evidence of its versatility. The software can format a hard disk using an error-map list that you enter, and it can then check the disk for additional errors. You can add any errors discovered to the bad-block list and remove them entirely from access by normal DOS operations, which may prove especially helpful with older drives.

The software works well, and I found just one glitch: The keymap is not USA1 (or any other USA format), and USA1 does not appear on the disk. This is a minor quibble, however, as you can make it through a normal installation with no problem.

On startup, the installation software checks to see which controller is present and then boots to the Workbench. You simply click open the ALF2 disk icon, open the ALF2-Install drawer, and click the InstallALF icon. From there, installation is automatic.

And a One and a Two

The ALF2 SCSI controller—versatile and easy to use—is a good performer, as the comparative data shows. (See Table 1 for DiskSpeed results.) I performed some tests on a nine-meg 36MHz-030-equipped A2000 with a 340MB Micropolis drive, a 80MB Quantum drive, MicroWay's flickerFixer, and an Interactive Video TrumpCard; others were run on standard 1-meg (chip RAM) A2000s. The ALF2 SCSI controller worked perfectly on Revision 4.1 and Revision 4.4 A2000 motherboards, but would not get past the white boot-up screen on two Revision 6.2 motherboards.

The ST412/506 RLL-style autobooting ALF2 controller is one of the few Amiga controllers that supports the common (read: "cheap") IBM-standard hard drives. (Commodore's A2090A also supports this type of drive, but only in the low-capacity—and usually slower—MFM format.) Because the ALF2 ST412/506 controller module supports the RLL encoding format and uses fast OMTI chips, it clearly out-performs the old A2090A, is not plagued by overscan problems, and can boot from an FFS partition. As with the ALF2 SCSI controller, this unit works on Revision 4.1 and Revision 4.4 Amiga motherboards, but fails on my two 6.2 motherboards.

The sometimes-confusing ALF2 manual contains a table of contents, a glossary, and several appendices, but no index. Even so, step-by-step instructions complement the automatic-installation software and all utilities on the ALF2 Extras disk. The appendices contain information on controller pinouts, drive types, ST-412, -506, and SCSI interfaces, and a useful section on third-party software installation on common hard-drive configurations.

I was disappointed, however, to find that the manual refers you to the documentation that comes with your hard drive for information on mounting the drive. I think the ALF2 manual should

describe the basic connections of the power, data, and LED-indicator cables. Along similar lines, hardware docs for the ALF2 base card and each module should list all jumper locations and functions with default settings, to help you avoid problems and diagnose any that do occur.

One feature of the software is a potential source of problems. When the system is set up without an accelerator card, the ALF2 software recognizes this and modifies itself accordingly for greater performance. If you install an accelerator later, you may find that the system no longer boots. To correct this problem, simply disable the accelerator card and use ALFPrefs to rewrite the hard drive's RDB booting information for an accelerated system.

SUPRA-IZE!

Like the ALF controllers, SupraDrive with WordSync comes in a variety of configurations for all Amiga models. You can buy it without a drive attached (as the ALF units come, for $199.95) or with. The SupraDrive unit I tested came with a Quantum 40s 3.5-inch drive mounted and wired to its half-card rails.

This hardcard is virtually idiot proof. Supra's documentation (a 90-page well-indexed manual and some additional stapled sheets) and the two accompanying floppy disks are skillfully assembled and quite complete. Virtually nothing is left to guessing—a good thing where hard drives are concerned. The card assembly appears to be of high quality, with no hanging wires or sloppy soldering.

Installation is simplicity itself. I ►

Table 1. Speed-test results with ALF2 and Supra WordSync.

ALF standard-format 42MB Quantum drive
Test Intensity: Med
Performance Stress: None

- 12 Files/s Create
- 37 Files/s Open/Close
- 117 Files/s Scan
- 16 Files/s Delete
- 200 Seek/Read

Buffer Size	512	4096	32768	262144
Bytes/s Create	28755	140468	224069	276168
Bytes/s Write	30031	186154	421075	509848
Bytes/s Read	67457	225008	411290	542659

ALF standard-format 42MB Quantum drive run with GVP 33MHz 68030
Test Intensity: Med
Performance Stress: None

- 16 Files/s Create
- 64 Files/s Open/Close
- 220 Files/s Scan
- 21 Files/s Delete
- 858 Seek/Read

Buffer Size	512	4096	32768	262144
Bytes/s Create	28636	149130	273634	431568
Bytes/s Write	29909	184809	522247	642190
Bytes/s Read	110315	282563	517216	728784

ALF standard-format 42MB Quantum drive run with GVP 33MHz 68030
Test Intensity: Med
Performance Stress: CPU and DMA contention

- 14 Files/s Create
- 50 Files/s Open/Close
- 135 Files/s Scan
- 18 Files/s Delete
- 433 Seek/Read

Buffer Size	512	4096	32768	262144
Bytes/s Create	28584	135300	209715	257863
Bytes/s Write	29987	174308	300431	327760
Bytes/s Read	67843	186543	270418	334152

SupraDrive with WordSync hardcard, Quantum 40s in 20MB partitions
Test Intensity: Med
Performance Stress: None

- 12 Files/s Create
- 60 Files/s Open/Close
- 243 Files/s Scan
- 52 Files/s Delete
- 419 Seek/Read

Buffer Size	512	4096	32768	262144
Bytes/s Create	29292	150215	268973	309971
Bytes/s Write	30081	174082	432611	484103
Bytes/s Read	150891	260364	440058	512933

SupraDrive with WordSync hardcard, Quantum 40s in 20MB partitions
Test Intensity: Med
Performance Stress: CPU and DMA contention

- 12 Files/s Create
- 48 Files/s Open/Close
- 168 Files/s Scan
- 51 Files/s Delete
- 222 Seek/Read

Buffer Size	512	4096	32768	262144
Bytes/s Create	29180	146047	265514	304003
Bytes/s Write	30038	174082	423733	484103
Bytes/s Read	92478	235676	440058	500812

All speed tests were performed using DiskSpeed 3.0 by MKSoft Development. Results noted are per second, according to MKSoft's specifications.

I would like to thank Kelly Keith for his help in testing.

opened my A2500 (with 6.2a motherboard), pushed the hardcard into an empty Amiga slot, and closed it up again. Because my 2500 came equipped with Commodore's A2090A autobooting controller and a Rodime 40MB ST-506 drive, I chose to disable WordSync's autobooting feature. This is a trivial task that involves moving one small jumper, thoughtfully located at the top of the card so that moving it again does not require removing the card from its slot. As with other hardcards, installing the WordSync in any slot other than the one nearest the power supply renders the slot to its right unusable (because of the width of the drive).

Although the manual's text and illustrations indicate that the drive requires a power connection from the Amiga, this is not the case. This card takes power directly from the slot into which you install it. This was the only major discrepancy I noted in the manual.

As with other Supra drives, this one uses the proprietary SupraMount command in place of a mountlist entry in the DEVS: directory. This simplifies matters further, as it frees you from the vexing chore of writing or editing mountlists. Booting off the Supra installation disk sets up the drive and runs SupraFormat, a very intuitive program that displays your hardcard partitions and lets you change or modify them easily. SupraMount supports up to 30 partitions per drive. I chose to leave the drive in its default factory configuration: two 20-meg partitions. You can format the entire drive, including the autoboot partition, with the FastFileSystem.

For expert users, Supra provides a program called SupraEdit, which lets you change low-level system information (the same data that would be stored in a mountlist entry—partition flats, boot priority, buffer sizes and types, and so on) for each drive partition. The manual warns you to stay away from SupraEdit "unless you absolutely know what you are doing." Good advice.

A drive-parking utility, the CLImate "dirutil" program, and other programs and icon-driven scripts round out the plethora of software included. Supra frequently adds to this software, providing updates by mail for a nominal fee, and for free on national electronic networks.

WordSync is Supra's own drive-accessing scheme devised to replace the common DMA (Direct Memory Access) method some other controllers use. I'm impressed by how well Supra's WordSync strategy meets the company's claims (see the DiskSpeed test results in Table 1). The WordSync hardcard is not the fastest setup on the market, but it's easily twice as fast as my 2090A-Rodime pair. I noticed none of the typical DMA slowdowns when talking to the WordSync drive while downloading at high speed, or when using DeluxePaint III (Electronic Arts) in full overscan.

The 40MB WordSync card-and-drive combo is well built, relatively fast, and as close to a turnkey system as I have seen. When sold by itself, the card is packaged along with the same excellent manual the hardcard system supplies.

HARD BARGAIN?

The Supra units beat out the ALF2 cards in the professional presentation department, but we were able to get better

speeds out of the less elegant ALF2s. Novices will almost certainly prefer the Supra products—especially the hardcard setup—while more experienced users may be attracted by ALF2 because of its showing in the speed tests. Supra is my choice because of its simplicity and because it gives you a better per-dollar value.

ALF2
Pre'spect Technics
1085 St. Alendre, Suite 500
PO Box 670, Station H
Montreal, Quebec
Canada H3G 2M6
514/954-1483
ALF2-RLL, $339
ALF2-SCSI, $371
No special requirements.

SupraDrive with WordSync
Supra Corporation
1133 Commercial Way
Albany, OR 97321
503/967-9075
$799 (with Quantum 40s drive)
No special requirements.

B A C K T A L K

CANDID RESPONSES TO *AMIGAWORLD* REVIEWS

Which Ware?

Your article "The Great Software Weigh-In" (Apr '90, p. 24) lists the program "QED" as being in the public domain. It is not. QED is freely distributable shareware; copyright is claimed and owned by me. In return for a $20 registration fee, I send documentation and a current program version. The program is now being enhanced and will likely be sold commercially in its final form. I believe that at least two other programs mentioned in that article—JR Comm and Access 1.3—are also incorrectly labeled as PD.

—Darren M. Greenwald
Santa Anna, CA 92704

In "The Great Software Weigh-in," I incorrectly identified QED, JR Comm, and Access 1.3 as public domain. When referring to software that can legally be shared without cost, I, like many people, sometimes inaccurately substitute the term "public domain" for "freely distributable." PD programs are freely distributable software that an author has fully released. Shareware is also freely distributable, but in this case, while the author may release distribution rights fully or partially, he does not relinquish ownership.

—Loren Lovhaug

Red Ink

In the article "Cutting the Red Tape" (p. 42 in the 1990 Video and Animation Special Issue), Geoffrey Williams states that ED-Beta , S-VHS, and Hi8 VCRs "offer twice as many scan lines (or more), which significantly improves the picture resolution. . ." Whoa there! The only time you will find more or less than 525 scan lines is in a non-standard com- ►

BACKTALK continued

puter display or in some foreign television standard such as PAL or SECAM. All recordable video in this country has 525 scan lines (that's the NTSC standard). Even the true component formats (M-11 and Betacam) and the so-called Y/C component formats (such as S-VHS and ED-Beta) use the NTSC signal system. These components can record more horizontal resolution than NTSC, but since horizontal resolution is expressed as a measurement of vertical lines, there is no connection with scan lines, which are horizontal.

The same article says that a "recorder should have at least four recording heads; fewer than that will not stand a chance of cleanly recording Amiga graphics." I've successfully recorded Amiga graphics onto 3/4-inch and S-VHS, which both sport two recording heads, and know of no VTR with more than that.

Finally, the caption "a Time-Base controller" accompanying the photo of a production switcher and two FOR.A TBCs could cause confusion for the uninitiated.

—*Joe Henry Morin*
Jasper, AR

While it is true that the number of scan lines remains constant in an NTSC signal, the ability to resolve them does not. Technically, high- and medium-resolution pictures have the same number of scan lines, but for all practical purposes, medium-res can resolve only half of them. It would be more accurate to say that the Y/C component formats offer higher horizontal resolution, making better use of the available scan lines, but the bottom line is that you get a much better picture.

The term "video heads" should read "recording heads"; I hope this did not confuse too many. I agree that the picture could have been cropped more carefully to show just the TBC, and the caption should refer to it as a Time-Base Corrector.

—***Geoffrey Williams***

Send your comments on reviews to Back Talk, *AmigaWorld* editorial, 80 Elm St., Peterborough, NH 03458.

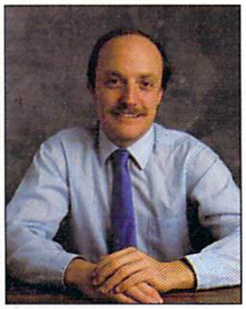
TAKE YOUR TURN!

We want to know what you like and don't like about your new Amiga hardware and software. Some products we are looking at for upcoming issues are:

ACE (USA Media)
A-Sound 2.0 (Deltaware)
The Art Department (ASDG)
Dr. Ami. . (Free Spirit)
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IntroCAD Plus (Progressive)
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Service Industry Accounting (Brown-Wagh)
Tiger Cub (Dr. T's)
TMFX Soundtool (Imtronics)
TV*Show (Zuma Group)
VIDI-Amiga (Rombo Ltd.)

To comment on these, write us (Your Turn, *AmigaWorld* Editorial, 80 Elm St., Peterborough, NH 03458) or call (800/441-4403, ext. 346) by July 18, 1990. We would like to hear from you at any time concerning other newly released products. ■

 Circle 173 on Reader Service card.



HORS D'OEUVRES

Hints, tips and techniques from your fellow Amiga users.

Compiled by Tim Walsh

MIND MY BUSINESS

WITH THE SHELL'S More command and a text file, I developed an inexpensive substitute for a calendar/reminder program. With a text editor, I created a short ASCII file of important dates and reminders of things I have to do. I then saved the file to my Workbench's T directory under the name of Notes. Finally, I used a text editor to add the following line between the LOADWB and ENDCLI >NIL: commands in my startup-sequence:

```
DF0:Utilities/More DF0:t/Notes
```

Now, whenever I start or reboot my Amiga, the first page of the Notes file automatically appears on the screen. Pressing the space bar displays the next page, if there is one, or closes the file.

Gerald Bozarth
Baltimore, MD

GET A LITTLE NEARER

FOR THOSE READERS who still use an old Epson printer that lacks an NLQ (Near Letter Quality) mode, here is a way to get an almost-NLQ printout. You'll need to use Workbench 1.3 and the epsonxold printer driver. (If you have an autoboot hard-disk system, substitute the volume name of your boot partition for DF0: in the commands.) Begin by typing the following in the Shell:

```
COPY * TO DF0:Utilities/NLQ2
ESC [1m
ESC [4"z
```

Press the CTRL and \ keys simultaneously to exit. Once the drive light goes out, enter:

```
COPY * TO DF0:Utilities/NLQ
COPY DF0:Utilities/NLQ2 to prt:
```

Again, press CTRL-\ to exit. Start IconEd (found on the Extras disk) and load a Project icon, such as one for a NotePad file. Save it to your Workbench Utilities drawer with the path- and filenames of DF0:Utilities/NLQ. Next, open the Utilities drawer and highlight the NLQ icon. Select Info from the Workbench menu, change the Default Tool to c/IconX, and then click on Save at the bottom of the Info screen.

Thereafter, when you want to print in NLQ mode, just double click the NLQ icon. An IconX window opens briefly, and the paper in the printer advances two lines. You'll find that the print quality is heavy and dark.

R. Markley Groff III
Upper Darby, PA

SAVING PAPER

A PAPER-CONSERVATION measure I practice on both my QMS PS810 laser printer and Star Micronics LaserPrinter 8 is to try to use both sides of each sheet of paper. Most Amiga word processors offer an option to print just the odd-numbered pages. After printing the odd pages, place them face down in the top paper guide, which can hold almost fifty pages, and then print the even-numbered pages.

Jose Plinque, Jr.
Houston, TX

TICK TOCK TIP II

THE MAY 1990 issue's tip for setting the date on Amigas lacking a date and time clock ("Tick Tock Tip," p. 102) was useful, but it stops the startup process. Instead, you can start another CLI for the clock task and let the boot process continue undisturbed. First of all, type the following file into a text editor and save it in the S: directory as Datesetter:

```
DATE
DATE?
SETDATE datefile
ENDCLI
```

The Setdate command sets the date of the named file, in this case an empty file called datefile. To create datefile, enter ECHO >datefile in the Shell. Next, early in the startup-sequence, add the following line:

```
NEWCLI "CON:150/10/300/50Set Date" s/datesetter
```

Now, when the computer is reset or first turned on, a small window appears displaying the date and a request to set it. Because the Amiga's operating system sets the time at boot to the time of the newest file on the boot disk, rebooting your Amiga several times in one day leaves the date correct. All you have to do is set the time.

Don Venhaus
Sunnyvale, CA

DISK WIPES?

NEED AN ECONOMICAL, original storage box for 3½-inch disks? Try an empty 84-count diaper wipes box. One of these all-purpose boxes can hold 25 megs of floppy disks with room to spare. For long range storage, put the disks into a plastic bag to keep out dust and moisture and place the bag in the wipe box. Their lids snap shut, and they stack beautifully.

Rev. Rick Opersteny
Houston, TX

If you have an idea you'd like to share with our readers, send it to Hors d'oeuvres, AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.* ■



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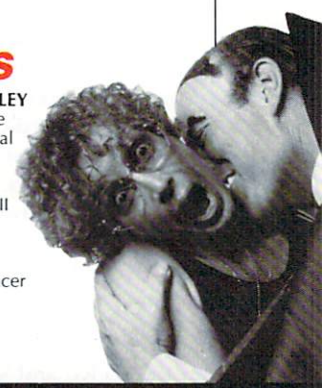
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WHAT'S NEW?

Get ready for a trip through time, a battle of the sexes, and enough stuff to keep your mind off August's heat.

Compiled by Jan Jackson

TIME AND TIME AGAIN

NOW PICTURE THIS: You are going about your business when, after some exploring (curiosity is your forte), you uncover a time machine. Performing its intended task, the machine hurtles you back into the Middle Ages to uncover an intergalactic plot woven by aliens. **Future Wars: Adventures In Time** ($49.95) challenges you to unravel puzzles, defeat foes, and rescue captives while crisscrossing through time. (Interplay: 3710 S. Susan, Ste. 100, Santa Anna, CA 92704, 714/549-2411.) *RS# 502.*



"When and where am I now?"

JAMBOREE

NOW THAT YOU are too old to be a Mouseketeer, what can you do to fill the void? Disney Software's **Animation Studio** can help you create full-length animations with characters of your own invention. You can use the paint and animation programs provided to produce cel animated clips. The package can teach elementary to advanced techniques such as squash and stretch, arc of motion, in-betweening, and path of action. Learn how to proceed from a rough concept to a polished product complete with music, sound effects, and speech. (Walt Disney Computer Software: 500 S. Buena Vista St., Burbank, CA 91521, 818/560-1000.) *RS# 504.*

PITHY POLYESTER

MEET LARRY'S MATCH in **Leisure Suit Larry 3: Passionate Patti in Pursuit of the Pulsating Pectorals** ($59.95). Play Larry the lascivious divorcé early on in the game, and then switch roles to Patti to examine Larry's tactics from the receiving end. The game includes a trivia test designed to screen participants for the higher levels, an hour of original music, and an auto-save feature. (Sierra On-Line: PO Box 485, Coarsegold, CA 93614, 209/683-4468.) *RS# 503.*

AND THEN SOME

IT'S THREE FOR one with Odyssey's **Super Games Pak** ($39.99). The first challenge, Deathbots, requires infiltrating a research facility to undermine a malevolently managed company that is building a gamma bomb. To succeed, you must sabotage the project before it's complete. The second game, JailBreak, offers multi-level arcade action, including blasting bricks with your cannon. You can also design and save up to 100 levels of original gameplay. In the final arcade game, help ByteMan debug a faulty circuit board by gobbling bad bits on multiple levels. This game features digitized sound effects, scrolling screens, and a simultaneous two-player option.

Space War ($39.99) invites you to fight for supremacy. Battle your opponents against the cold backdrop of space while avoiding solar flares, Black Holes, and asteroids. (Odyssey Inc.: PO Box 367, N. Eastham, MA 02651, 800/323-9421, 508/240-2317). *RS# 504.*

In multimedia news, **Elan Performer 2.0** ($149) hit the streets supporting more image formats and new control features. Performer 2.0 can link directly with other applications, thanks to its ARexx capabilities. For upgrading information, registered owners can contact Elan Design: PO Box 31725, San Francisco, CA 94131, 415/359-7212. *RS# 505.*

For computing with real feeling, try **TouchDriver**. The program, which emulates a two-button mouse, is designed for use with MicroTouch Screen, a hi-res, analog-capacitive touch screen. It promises to run Amiga software by touch and features an expanded Preferences menu. You can use TouchDriver to operate multiple serial devices via multiplexing touch screen controllers. The retail price for screen and driver is $895. (MicroTouch Systems: 55 Jonspin Rd., Wilmington, MA 01887, 508/694-9900). *RS# 506.*

Any program that accepts keyboard input can be synchronized with events in the outside world by using **VidControl** ($30), a general purpose input mechanism that synchronizes upon command.

MasterControl ($50) provides the same capabilities, but allows asynchronous interfacing with up to six discrete inputs as opposed to the one input used by VidControl. (Integral Systems: PO Box 31626, Dayton, OH 45431, 513/237-8290). *RS# 507.*

Soft-Logik Publishing parted the curtains on **PageStream 2.0**, the latest version of its desktop-publishing package. Now you can use PageStream to draw polygons with Bezier cubic curves and to load and save tags separate from a document. Version 2.0 allows for specifications of font sizes and the beginning and ending angles of arcs, and it positions and sizes an object. Program upgrades are available to registered users for $75.

If your Amiga is an office drone, **Business Forms** ($39.95) can help increase ►

efficiency and raise employees' spirits at the same time. Instead of typing forms manually or duplicating standard documents, your workers can choose from 40 available forms, fill them out on screen, and then print them out. Templates for accounting, invoices, office memos, and purchase orders are included. (Soft-Logik Publishing: 11131F S. Towne Sq., St. Louis, MO 63123, 314/894-8608). *RS# 508*.

Get help with job estimates, bids, and bookkeeping with Sybiz Software's **Service Industry Accounting** ($395). Use the program to prepare a bid, and, once you have landed that job, the estimate and all ensuing transactions are automatically posted. Service Industry Accounting adjusts accounts receivable and payable, inventory, and general ledgers accordingly, from the job's inception to conclusion.

Make snappy presentations and reports with help from **BGraphics** ($195), a graph- and chart-generation tool from Technical Resource Systems Laboratory (TRSL). Pick from over 20 chart types, including line, scatter, column, bar, and pie, in 2- or 3-D. BGraphics can automatically generate a legend and accept IFF images for backdrops, columns, and movable objects. Both Service Industry Accounting and BGraphics are available from Brown-Wagh Publishing, 16795 Lark Ave., Suite 210, Los Gatos, CA 95030, 408/395-3838. *RS# 509*.

On the mechanical drawing scene, **DynaCADD** ($995) provides 2- and 3-D drafting software for electrical, mechanical, architectural, or civil applications. DynaCADD features automatic dimensioning to European or North American standards and supports Workbench 2.0, PAL/NTSC, and the impending UNIX. (Ditek/ISD Marketing: 2651 John St., Unit 3, Markhan, Ontario, Canada, L3R 2W5, 416/479-1880). *RS# 510*.

MIDI Quest, a universal editor/librarian, comes with configurable MIDI drivers, integrated graphic editing, multi-instrument filing capabilities, a sequencer, and a controller. You can use patch files from Amiga or other computer formats and combine voices within banks in three modes: slide, mix, and blend. MIDI Quest's driver creator lets you monitor MIDI I/O. (Sound Quest Inc., 1573 Eglinton Ave. W, Suite 200, Toronto, Ontario, Canada, M6E 2G9, 416/256-0466). *RS# 511*.

Add motion to your VideoScape 3D (Oxxi) animations without relying on the CLI by using **ProMotion** ($99.95). Instead of keying in x, y, and z coordinates manually, simply draw a line to indicate direction. Features include object shadows, magnetism, gravity, and wind, plus the ability to manipulate light sources, camera attributes, and bank and pitch settings.

The latest version of Oxxi's video character- and effects-generator features 3-D text manipulation, built-in animation facilities, and a re-designed user interface. **VideoTitler 1.5** ($159) lets you extrude text for a solid-object look and includes animation facilities for text scrolls, wipes, and fades, among other effects. (Oxxi Inc.: PO Box 90309, Long Beach, CA 90809, 213/427-1227). *RS# 512*.

M.A.S.T.'s **Fireball A2000 SCSI Controller** promises sustained transfer rates while multi-tasking. This hard card includes autoboot ROMs that you can disable via a switch, plus three LEDs to indicate autoconfigure, board select, and DMA access. (M.A.S.T.: 1375 Greg St., #106, Sparks, NV 89431, 702/359-0444). *RS# 513*.

For your programming needs, **Toolbox** offers a configurable environment with integrated editing and compiling, a program-generation tool, and an editor-definition language. The program's text editor supports up to 32 files, text selection, and up to ten simultaneous search strings. (Mirage Studio: 5 Gipsy Ln., Wokingham, Berkshire, England RG11 2BN, 0734-788965 or International: 44734-788965). *RS# 514*.

Beta Unlimited has let its 16-bit audio processor out of the bag. **AudioLink** boasts 16 voices (eight in stereo), a quicker sampling rate, and an on-board MIDI port. It comes with sound-editing software that features real-time playback, cross-fading, and cut, copy, and paste between voices. It also saves in multiple formats, including AIFF and SAMP. (Beta Unlimited: 87 Summit St., Brooklyn, NY 11231, 718/852-8646). *RS# 515*.

If you are a sysop wanna-be, Inner Circle Software might suggest its **Paragon BBS** ($165). Up to ten users can log on simultaneously for multi-user conferences or on-line games. Paragon supports FidoNet, which allows networking with over 6000 other BBSs worldwide and lets you configure up to 128 messages and 40 file areas. A download utility lets users compress messages into ARC-, LZH-, and ZOO-format files. Sysop tools include a user and file-area editor and a remote DOS shell. (Inner Circle: PO Box 486, Northboro, MA 01532, 508/393-3875). *RS# 517*.

RamWorks 500 ($99), an internal 512K memory and clock card, boosts Amiga to 1MB of RAM. The built-in clock function automatically stamps your files with time and date, and a graphical diagnostic program checks for bad or improperly seated chips. The card comes with a five-year guarantee. (Applied Engineering: PO Box 5100, Carrollton, TX 75011, 214/241-6060). *RS# 518*. ■

Circle 74 on Reader Service card.



HELP KEY

Just when you're ready to toss in your Amiga as a boat anchor, Lou the Lifeguard springs to its rescue.

By Louis R. Wallace

Two Too Many

Q: *My A500 is equipped with a 512K expansion module (the A501) and an 8-megabyte Microbotics 8-UP board, giving me a total of nine megs of RAM. I'm adding a hard disk, and I want to get the GVP Impact SCSI controller with an additional two megs of RAM. Can I use the AmigaDOS 1.3 command MERGEMEM to access this, giving me a full 11 megs?*

D. Hoffmann
Corning, NY

A: Sorry, but those extra two megs would be wasted, at least for today. The A500 and A2000 both have a 9-meg memory limitation (at one time no one ever thought they would need even that much), which can be surpassed only by making some severe hardware and software hacks to your system. To be on the safe side, I called GVP to make sure the developers didn't have any surprises up their sleeves, and the technical-support representative told me they *do* plan on some post-2.0 hardware that would allow you to exceed the limit. We will have to wait and see what they (or others) come up with.

On the other hand, A3000 owners don't have any practical limits to the amount of memory they can have. The motherboard can handle up to 18 megabytes, and you can put much more than that in one of the Zorro III slots by using a memory board.

Recyclable RAM?

Q: *I already have an A1000, but I am thinking of buying one of the new A3000 systems. My question concerns RAM chips. Will I be able to use any of the chips in my A1000 or its expansion RAM boards? Exactly what kind of RAM chips does the A3000 use?*

Fred Lonzaloes
LosAngeles, CA

A: It's possible, but it depends on the type of RAMs used in your A1000 expansion device. There is information in the A3000 documentation on the chips it can use. You can use either 256K × 4 (giving a total of 6 megs) or 1M × 4 chips (for a total of 18 megs), but they cannot be mixed together. The suggested RAM speed is 80 nanoseconds or less, and you can use either page or static-column mode chips.

Snap, Crackle, and Pop

Q: *I'm having a problem displaying interlaced high-resolution screens. After working for about an hour (using programs like IntroCAD and Design3D), my screen begins to deinterlace. It appears that I'm losing every other scanline. Eventually, the scanlines do reappear. In addition, my A1084 monitor often makes a high-pitched whine as well as static discharge sounds. Do you have any ideas or suggestions?*

B. Gregor
Salem, OR

A: I strongly urge you to take your system to a service center for a checkup. If left alone, it might get worse and cause other, expensive and avoidable hardware failures. I have heard of problems with A1084 monitors making occasional "snapping" and "popping" sounds, but the sounds don't necessarily mean the monitor is failing. Your Amiga is a fairly expensive investment, and making that trip to the service center often pays off in the long run.

Crossing Directions

Q: *Help! I have an A2286 AT Bridgeboard, and I really like it. I would like to get more information on using it, but don't know where to look. I've called Commodore and can never get anywhere; the Amiga magazines hardly ever offer articles on the subject; and the PC magazines never talk about them. Where can I find help on using my Bridgeboard?*

G. West
Seattle, WA

A: A great source of information is *Amiga Crossings*, a monthly newsletter devoted to users of Amiga Bridgeboards. Published by Marion Deland, it costs $40 a year. Direct your questions and requests to *Amiga Crossings*, 345 East 93rd St., Apt. 26E, New York, NY 10128.

Transfer Update

Casey Perry of Columbus, Ohio wrote to Help Key to offer another, cheaper solution for J. Riedel's problem of transferring MS-DOS spreadsheet files to the Amiga (Jun. '90, p. 106). Casey recommends using a program called PCPATCH (found on Fred Fish Disk #218), which makes changes to the PCCOPY and PCFORMAT programs in your 1.3 PCUTILS drawer. PCPATCH allows these programs to work on the Amiga's drives as long as the disks are in $3^1/_2$-inch, 360K PC format.

I did some checking, and the same program is also available on PeopleLink in the Amiga library. The file reference number is 13973. On CompuServe, it is in the AmigaTech libraries under the name PCPATC.ARC. On GEnie, look for PC_TO_AMIGA.ARC (file number 5369). GEnie also has an upgrade called PCPATCH2.ZOO (file number 6135) that will work on 720K MS-DOS disks as well as on Atari ST-formatted disks. ■

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Featured Disk

WB29: Graphics and Sound - This disk has several different Mandelbrot type programs for generating stunning graphics. Includes, MandelMountains - a realistic terrain generator, Fracgen - generated recursive fractels from user input, Mandelbrot and Tmandel - two fast mandelbrot generators, also Mostra - the best IFF display program to date, will display ALL IFF's including Dynamic HAM, and Sound - a great IFF sound player, will play anything, we mean anything. Try this disk, you'll love it!

New Disks

FD29: Shoot'em up's - WWII - your the pilot of a world war II plane flying through enemy territory, you've just been spotted, good luck on you mission, SpKiller - try and penetrate enemy lines with this game, and Retaliator - another great game.
FD30: Arcade - several good games including, pacsim - a pacman type clone, AmyHawk - a great shoot'em up, SnakePit - similar to light cycles, TumTots - your the rescue squad trying to save a bunch of babies from a multi-story building that is on fire, opps don't drop any..., VirusGame - stop the virus before they infecting your computer, very well done game.
FD31: Games! - Air Traffic Control - a good ATC simulation game, Black Jack Lab - a full featured set of card games, ChessTel - play chess with your friend in distant and remote places with this game and a modem, labyrnth - a well done text adventure game (like an infocom game), and MouseTrap - a 3d maze game.
WB30: MultiMedia - "The Birth of Film" by Gene Brawn (the developer of the NewTech Demo Reel 3), is an ambitious multimedia work-in-progress illustrating the evolution of motion pictures up to 1905. This version was developed to accompany an article in the June 1990 issue of AMIGA WORLD magazine. Requires AmigaDos 1.3, at least one megabyte of memory and two floppy drives or a hard disk. Also includes the Deluxe Video Player. Two disk set counts as ONE!
WB31: CanDo Decks - several programs made from cando, A directory browser, Icon maker, File browser, puzzles, Bart Simson animation?, Deck browser - lets non-owners of cando use cando decks, paint program, and a game.
WB32: Text Editors #4 - Includes AZ - a powerful full featured text editor, TextPaint - Enhance your text files with color fonts attributes, and graphics with this great text processor, recommended for anyone doing disk based documentation, Uedit (25e) this is one of the most powerful editors available PD or commercial, great for the power editor/user.
WB33:Circuit Board Design - several terrific routines for the electronic enthusiast, Including PCBtool - a circuit board design tool, LogicLab - circuit logic tester, and Mcad (1.26) a well done new release of this PD cad program, now comes with predrawn common circuit components for insertion into schematics.
WB34: Utilities - Several well done utilities, some will require moderate knowledge of a CLI or Shell for setup, Chatter Box - this one will play any user defined sound after any event (ie. disk insert, mouse click, disk removal...), I once saw a person have this program play MR. Spoc's saying "Illogical Illogical" when a non-dos disk was inserted, Artm - The Amiga real time monitor, gives you full control of the Amiga OS, very powerful program, Helper - help program to make learning the CLI easier, PopMenus - for those of you with mouse accelerator programs, this one brings the pull down menus to the mouse, setfont - a working version that changes the system font to user specified font, and many more!
WB35: 3d Graphics - This disk contains several neat programs to use with your 3d modeling/raytracing programs 3dFonts - Full vector font set for use with 3d programs, FontMaker - make 3d fonts from any system font, Make3DShape - create 3d shapes from any image, DumptoIFF - create 3d animations preserves pallet, and World3d - a demo program of a front end for use with DKBRender.
WB36: Graphics - On this disk are several programs to create stunning graphical images including, MPath - creates swirling galaxy images, Roses - produce an unlimited number of variations of images that a symmetrically similar to a rose, SimGen - display those spectacular images as part of your workbenck screen, and RayShade - a very good raytracing program, create your own beautiful 3d graphic models with this one!
DD59: Un*x #2 - csh 4.01 - a un*x style shell, and sksh - a full featured ksh shell with , tail, head, cmp, cp, crc, diffs, du, fgrep, grep, join, srun, tee, wc, and xd as external routines.DD60: Un*x and others - Several Un*x styled utilities including, Cron, calc, filefind, ls, page, rm, uxparse, Conzap - connect a vt100 monitor to serial port, FlashDix - floppy disk optimizer, Mathtrans - utilize your 68881, 68882, 68040 automatically!
DD61: Rom Kernel Manual 1.3 - the complete source code examples and compiled versions to accompany the printed version by A&W.
DD62: Basic and Xscheme - Cursor - a full featured Amiga Basic compiler, sbasic and ftext - several wonderful routines to help in basic programers, and Xscheme - an interpreted object oriented programing language.
DD63: Tests - With the soon to be released new version of workbench and the Amiga 3000, we though that releasing all of the classic speed tests and system checks would be in order. Includes but not limited to, CPU Speed, Sieve, Salvage, Speed, STU - a full featured system diagnostic tool, Memory integrity test, Disk integrity test, and a couple of graphic tests.

Other Great Disks -

FD5: Tactical Games - BattleForce(3.0) see MechForce on FD20. BullRun - a Civil war battle game, Metro - you play the role of a city planner. Build wisely and your system will be a success, but poor planning will lead to disaster and financial ruin. Very good Amiga version of Kingdom, Golden Empire, Etc. Very very habit forming.
FD6: GAMES! - This disk is chalked full of games including; Checkers, Clue, Gold - A new slide the pieces puzzle, Jeopard - An enhanced version of Risk, RushHour - Surprisingly addicting, and SpaceWar - Best described as a cross between Combat-Tanks and asteroids.
FD7: PACMAN - This disk contains several pacman type games including; PacMan87, MazMan and Zonix.
FD10: HackLite - A dungeon adventure game. Considered a must have classic. This is the second release of this game on the Amiga. Originally a UNIX game. Great Amiga graphic interface. Fills the whole disk. Play time several weeks!
FD12A,FD12B: Star Trek, The Game - This is by far the best Star Trek game ever written for any computer. It features mouse control, good graphics, digitized sound effects and great gameplay. Counts as 2 disks. Req. 1Mb and two drives (or hd).
FD13: Board Games - contains multiplayer Monopoly, Dominoes, Paranoids, and others.
FD14: Dungeon Master Hints and Arcade Games - DM maps, spells, item location, and hints and more, also on this disk, Hball - an arknoid/break out type game, Trix - a Qix type clone.
FD16: Strategy Games - Includes Diplomacy and Empros, both great conquer and rule multiplayer games similar in concept to Simcity and Populas. Also includes blackbox, hearts, and others.
FD17: Educational Games - This disk includes several games for the younger memebers including geography, math, science, and word games, also includes Wheel of Fortune.
FD20: Tactical Games - MechForce(3.65); A game that simulates combat between two or more giant, robot-like machines. Simple words can't begin to give you the feel of piloting a 30 - 40 foot tall, fire breathing, earth shaking colossus that obeys your every whim. This game is the full featured update to BattleForce(3.0) on FD5.
FD22: Arcade Games - This disk has MoonBase - The best lunar lander game we have seen in a long time, very challenging and addicting, Also BoingGame - a maze type, donkey kong type game.
FD24:Strategy Games and Others - Includes Dicey, a yathzee type clone, MM a master mind type clone, Flipper an othello type clone, China an great implementation of Shangi, CircutWars a challenging game based on electronics, and Etrain a computer based model train set construction set for the enthusiast.
FD25:Tactical Games - Empire (133w)Empire is a rich simulation of international politics, economics and war, which is played over a period of a few of months by 2 or more people. Players can run their countries from the normal Amiga keyboard, or via a modem at 300 to 2400 baud.
FD26:Arcade Games - Marble_slide, truly this is a commercial quality game. Similar to a Lucas game named PipeDreams, excellent playablitly and entertainment, Mutants , a small version of the arcade game of the same name, also SuperBreakout a pong/arknoids type game.
FD27: Arcade Games - This disk is loaded with some great games. Includes, Raceorama a great racing car game with ten different courses, MiniBlast a helicopter gunship type clone, Shark in the same class as froger.
FD28: Games! - This disk contains several great games including, DripGame - Sort of belongs to the PacMan type clone category but not exactly. This is truly a new and great original gaming idea. Very addicting, excellent playability, highly recommended. Pyramid - a Q-Bert type clone. Also, KingOil - a challenging board game were you are the leader of a wild cat oil team. Object - try and become another Exxon.
WB4:Telecommumnication - This disk contains several excellent pd communication programs designed to get you on line quickly and easily. Access (1.42) - A very nice ANSI term program based on Comm v1.34, but with the addition of transfer protocols, Comm (1.34) - Last version of one of the best public domain communications programs ever made on the Amiga, Handshake (2.12a) Handshake is a Full featured VT52/100/102/220 terminal emulator, and JRComm (0.94a) another great com program.
WB5 - Fonts #1- Several fonts (35) for the Amiga, also included are five PageStream fonts,and ShowFont - a font display program.
WB10:Virus Killers - The latest and best VirusX(4.0), Kv(2.1), and ZeroVirus(1.3).
WB11: Business - Clerk(4.0), finally a full featured business accounting PD program for the small to medium company. Includes receivables, payables, end of month and much much more.
WB12: Disk Utilities - This great disk is loaded with wonderful utilities for everything including making disk labels, disk cataloging, disk optimizing, disk and file recovery archive and organizing, and all sorts off file minipulation. A real must have!
WB15: Business - This disk contains a spreadsheet, a database, a project/time management program and financial analysis (stocks).
WB16: Business - This disk contains an inventory manager, a loan analysis program, a great calendar/schedular, a rolidex program, and pennywise a good "Cash Book" accounting for home or office.
WB18: Word/Text Processors - This disk contains the best editors that we could find. Includes, WordWright(v6.2) a full featured word processor with mail merge and outlining capacity, Dme(v1.35) a great programers editor with strong macro features, and TexED(v2.8) an enhanced Emacs type editor.
WB20: General Interest - On this disk is, DiskSalv V1.42 a disk recovery program for all Amiga file system, FixDisk V1.0 another file recovery program with features DiskSalv doesn't have, 3DLook a program that gives a 3D appearance to your WorkBench, Clean V1.01 a program to de-fragment memory, Tracer - trace any part of that image.
WB22: Fonts #3 - Several more great fonts. These, like the other font disks work great with Dpaint and WYSIWYG word processors.
WB23: Graphics and Plotting - Plot (20b) a three dimensional mathematical function plotter. Can plot any user defined function, all aspects controllable,, BezSurf2 is a program for producing bezier surfaces of revolution. It produces awesome pictures of objects one could turn on a lathe. Can also map iff image files onto any surface that it can draw. Now compatible with most 3D packages and VScreen makes a virtual screen anywhere. For you DTP people this is a absolute must have, it allows full page editing without redraws!
WB25:Educational - On this disk are two programs that can generate maps of differing types, World Data Base uses the CIA's data base to generate detailed maps of any enter user global coordinate. . Also Paradox a great demonstration of Albert Einstein General Theory of Relativity.
WB26: Disk Utilities #2 - MrBackup, KwickBackup - two well done utilities to help with harddisk and floppy disk backups, FileMast - a binary file editor much like NewZap, Lableprinter - a brand new Disk label printer with some of the most powerful features we have seen to date, each designed to give maximum control over what shows up on your labels.
WB27: Nagel - This disk contains 26 Patrick Nagel pictures of beautiful women.
WB28: Scientific - On this disk is MATLAB or MATrix LABoratory. this provides comprehensive vector and tensor operations.
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DD49: C Compiler - contains zc(1.01) fully K&R, zcc(1.0) front end, A68k(1.2) assembler, Blink linker.
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DD55: ARP - On this disk you will find the complete ArpRel3.0 release including the full user docs, the full Developers guide, and Conman (1.4). ARP is the official AmigaDOS Resource Project (ARP) release 1.3. ARP makes many improvements to AmigaDOS and makes your system easier to use from the CLI.
DD56: UN*X #1 - Several Un*x type programs including Bison (2.0), Byacc(1.0),Gawk and M4.
DD57: Advanced Utilities - Msh - like Cross-dos, copies files to and from MS-DOS, Pal-NTSC - convert any pal program to NTSC and visa versa, IconJ - a new improved IconX clone, KillAgnus - disables 512k of chip ram, Also several utilities that improve your startup-sequence, plus 25 more programs.
DD58: Compression #2 - Tar - a unix type backup/archiver CompTool- cando stack to help with archiving, Convert - convert arc,zoo, and pak files to Lharc, Lharca99c - an intuition based Lharc, Lhunarc - a very fast unarcer, and Text - article on compression algorithms and source.

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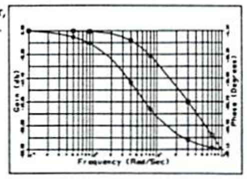
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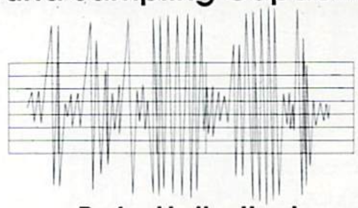
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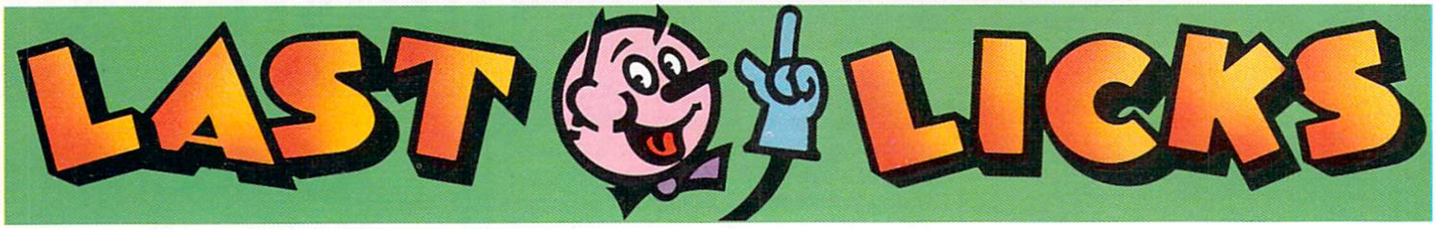
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Adieu, adieu mon cher Guru

By now, you have heard that Workbench 2.0 transports our beloved guru of errata into oblivion. For those who might miss this annoying friend, we have come up with a list of all-new Gurus:

Guru meditation #900001025: Sneeze error. Keyboard too slippery for use. Potential viral risk.

700005567: Big Brother Corrupt. This message is provided to inform you of keyboard taps.

2000666: Breaktime Buddy. The Computer has determined that 12 nonstop hours of computing is too much. Go to the bathroom.

69000005: Bus error. Scab keyboard smashed by a striking Greyhound worker.

90000399: Code blue guru. A string of commands went down the wrong way. . .your computer is choking; administer the Sassenrath maneuver!

1115514645B: Flotsom and Jetsam Checksum. You and your Amiga are sailing the salty seas—and taking on water. Check the bilge pump to see if it is functional, then signal the Coast Guard and back up your hard disk.

800340500: Goo Error. Cutesy chocolate floppy disk lodged in real floppy disk drive. Total meltdown. Time to punish the little one.

8009500: Illegal Instruction. Amiga unwilling to participate in cock-eyed bank-fraud scheme.

9000056: Insufficient Memory. Overloaded user failed to remember all significant commands. System requests user buy Nintendo.

400050007: Different plane error. You are being contacted by an inhabitant of the netherworld. Shut off all interior lights, reboot, and then await further instructions.

00007892: Recalibrate:checkmate. Your multitasking Amiga has been playing a game of mental chess with Uri Geller, and. . .congratulations, it just won!

7878787878: Exec check failure. Under special circumstances (full moon, Mercury in retrograde, etc.), your system can detect your contact with IBM CPUs. Using the CLI, key in an apology and pray your system possesses a capacity for forgiveness.

2205405: Wife Alert. The Computer has determined that 24 nonstop hours of computing is too much. Pay attention to your wife.

Ear to the Wall

Good for what ale's you. Our Canadian neighbors will be seeing a Molson Brewing Company commercial smacking of Amiga animation. The first-place winner in AmigaWorld's animation contest, Stephen Menzies, recently told us that his prize-winning FeO footage will appear in Molson's summer advertising campaign. He also said, however, that he was unsure whether those of us south of the border would be able to view said ad on US TV.

How is your Deutch? Time is running out for those of you trying to win that free trip to Amiga '90 in Cologne, West Germany in INOVAtronics CanDo contest. The Grand Prize includes two round-trip tickets plus hotel accommodations. Pack up your CanDo applications and ship them off to INOVAtronics (8499 Greenville Ave., Ste. 209B, Dallas, TX 75231, 214/340-4991) before the August 31st deadline for eligibility. Three first-prize recipients will receive $500 credit towards the purchase of merchandise from participating dealers. Five second-prize winners will receive $100 credit. Twenty third-prize winners will receive the 20 best applications submitted. Contact INOVAtronics for the contest rules.

CPU crisis line. By now, most of you have heard of Commodore's new 24-hour, toll-free helpline. Although it sounds very much like a suicide hotline, it is not. However, it may reduce anxiety attacks among frustrated but otherwise proud new A500 owners. Commodore's V.P. of Customer Satisfaction Jim Reeder claims the hotline is the first of a number of innovative new services in the works. Commodore Express, a door-to-door customer service program for A500s, is also part of Reeder's plan. The helpline service offers assistance in the setting up and operation of new Amigas. If an ailment is undiagnosed, the unit is picked up, replaced or repaired, and returned—all free of charge.

Computer of champions. At press time, Commodore was in final negotiations with the 1992 Olympic committee. Commodore Ltd.'s Greg Kohler said this is an opportunity for the Amiga to play a major role in the Barcelona, Spain games.

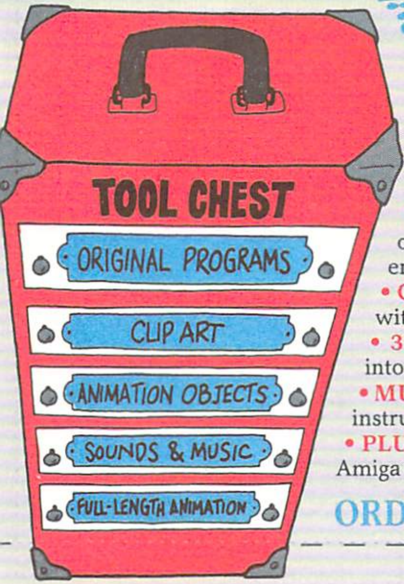
Mutiny. Several former Paragon Software programmers are off on their own with a new company called Event Horizon Software. An Event Horizon spokesman cited personal and creative differences as reasons for the rift.

Texas Swing. According to a spokesman for Texas-based Applied Engineering, we should very soon be seeing a high-density floppy drive and modems that can be upgraded for sending fax transmissions.

Adding on. The colorful crew at Comp-U-Save is going international, according to a company representative. A high-profile personality was recently spotted in Europe looking for leads.

Holy Smokes! Amiga '90 show attendees saw an interesting sight in Basel, Switzerland recently—an IVS's Trump Card Pro prototype running $3\frac{1}{2}$ minutes of low-res HAM images at 30 frames per second (with sound) off a hard disk.

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177	182	187	192	197	377	382	387	392	397	577	582	587	592	597
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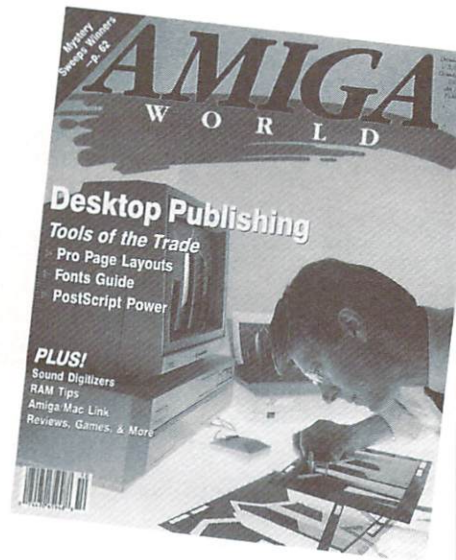
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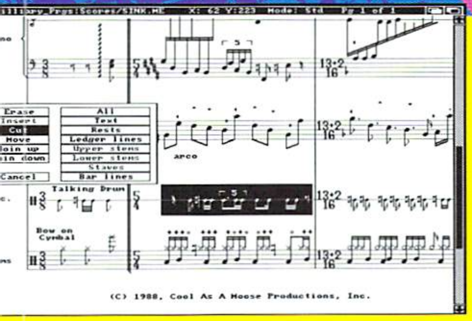
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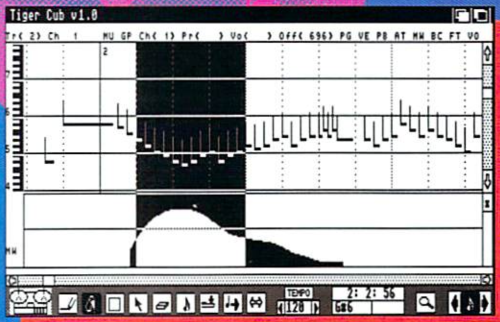
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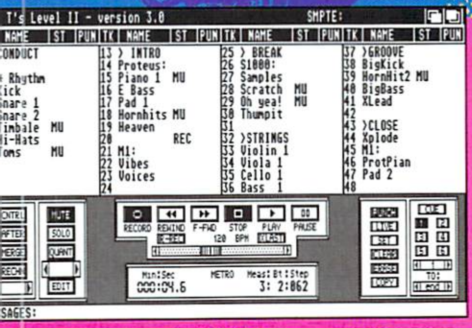
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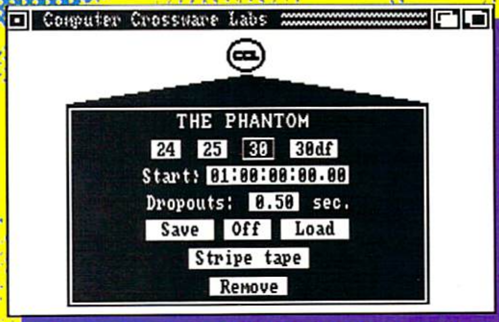
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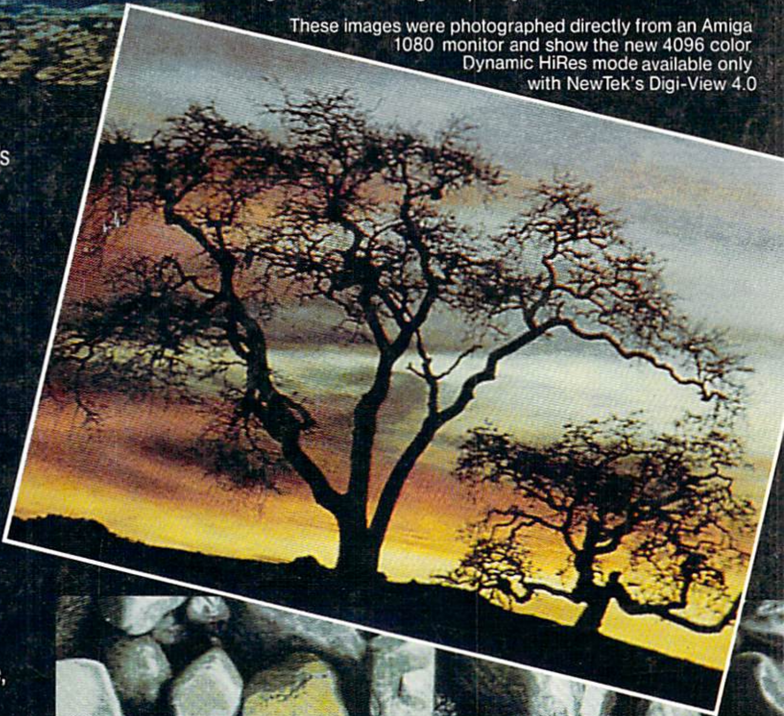
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